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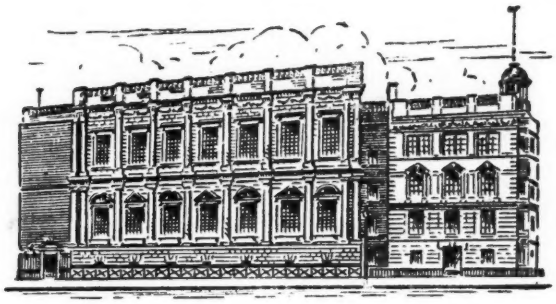
JOURNAL



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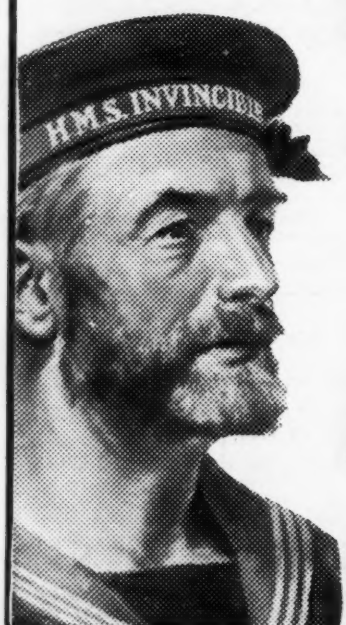

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The Royal United Service Institution is situated just below the War Office in Whitehall. It has the best professional Library in the United Kingdom; a Lecture Theatre where an autumn and winter session of lectures is devoted to subjects of current or historical Service interest. The Reading and Smoking Rooms are provided with the leading papers, periodicals and writing materials.

The Institution is open daily from 10 a.m. to 7 p.m., except Sunday, Christmas Day and Good Friday.

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The R.U.S.I. JOURNAL is published quarterly and sent post free to Members in any part of the world.

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Situated in the Banqueting Hall of the old Palace of Whitehall (1622), with its magnificent Rubens ceiling, the R.U.S.I. Museum is a treasure house of relics and mementoes of great victories and renowned warriors. There is also a most valuable collection of Uniforms, Medals, Ship Models, and models of the battles of Trafalgar and Waterloo.

For Members and their friends, there are private entrances to the Museum from the Institution.

H.M. Forces in uniform are admitted free at the public entrance.

Admission to the general public is 1s.; Saturday after Noon, 6d.

SECRETARY'S NOTES

August, 1930.

Centenary Celebration, 1931

Attention is invited to page 557 of this JOURNAL giving a preliminary notice in regard to the Celebration of the Centenary of the Foundation of the Royal United Service Institution.

Council

Admiral Sir Frederick L. Field, K.C.B., K.C.M.G., has succeeded Admiral of the Fleet Sir Charles E. Madden, Bart., G.C.B., G.C.V.O., K.C.M.G., LL.D., as an *ex officio* Member of the Council on becoming Chief of the Naval Staff and First Sea Lord.

New Members

ROYAL NAVY.

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Captain E. M. Compton Mackenzie, O.B.E. (late R.M.).
Midshipman M. E. Butler-Bowdon, R.N.
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Lieutenant-Commander H. T. White, R.N.
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Lieutenant J. H. Unwin, R.N.

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Captain M. G. Noll, Royal Signals.
Captain G. G. R. Williams, The Loyal Regiment.

Gentleman Cadet L. R. C. Stucley.
Captain A. C. Moreing, Reserve of Officers (T.A.).
Captain J. B. P. Seccombe, 13th Frontier Force Rifles.
Major The Hon. H. A. Law, M.C., K.O.Y.L.I.
Lieutenant R. E. Lampen, The King's Regiment.
Captain L. W. Lane, M.C., The Royal Sussex Regiment.
Captain W. J. Dynes, R.E.
Lieutenant A. J. Knott, R.E.
Lieutenant E. H. T. Gayer, R.E.
Lieutenant J. Higginson, Royal Tank Corps.
W. B. Fairbairn, Esq. (late Lieutenant), General List.
Lieutenant J. F. Snow, Somerset Light Infantry.
Gentleman Cadet T. Kidd.
Captain J. Manby, 7th Gurkha Rifles.
Captain J. M. Grant, The Seaforth Highlanders.
Lieutenant C. D. T. Pope, R.A.
2nd Lieutenant R. V. Boyle, The Loyal Regiment.
Major V. J. F. Smith, Royal Fusiliers (retired).
2nd Lieutenant L. T. Lillingston, Scots Guards.
Lieutenant J. Johnstone, Durham Light Infantry.
Captain R. C. Howman, 20th Burma Rifles.
Lieutenant J. V. Faviell, The Lincolnshire Regiment.
Captain E. W. Foster, R.A.
2nd Lieutenant T. H. Jefferies, R.A.S.C.
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Lieutenant C. E. Dixon, K.O.S.B.
2nd Lieutenant J. F. M. Macdonald, K.O.S.B.

ROYAL AIR FORCE.

Squadron Leader R. M. Drummond, D.S.O., O.B.E., M.C., *p.s.a.*

Members Joining in October

The attention of potential Members is invited to the fact that if they join on or after 1st October of the current year, they are not called upon for any further subscription until January, 1932.

Special Facilities for Junior Officers

The special attention of Members is invited to the conditions now governing the entrance of Junior Officers to the Institution. The terms are as follows :—

" Commissioned Officers of the Home, Dominion, Indian and Colonial fighting Services and their Reserves, of three years or less seniority as such; Midshipmen R.N., R.N.R. and R.N.V.R.; and Naval, Military and Air Force Cadets, shall be admitted to Membership without Entrance Fee on payment of the first annual subscription of £1 5s.

" In all cases eligibility for such Membership shall be governed by para. 1 of Chapter 2.

" An Officer who is admitted without entrance fee and who subsequently fails to pay his annual subscription regularly or resigns, shall not be re-admitted without payment of such fee, notwithstanding the fact that he may, by virtue of his rank or seniority, be otherwise eligible for such concession."

Gold Medal Essay for 1930

Competitors are reminded that essays for the 1930 Gold Medal Competition must reach the Secretary by the 15th November.

In connection with these Competitions the Council have decided that in future essays will be adjudicated on their general merits, and the expression of views which do not conform strictly to generally accepted opinions will not necessarily be considered to detract from the value of an essay.

Authors should be careful to avoid the introduction of confidential matter.

Programme of Lectures

The Programme of Lectures for the 1930-31 Session is well advanced and copies will be sent to all Members shortly.

JOURNAL

Notes for Guidance of Contributors

The Editor has been asked to publish some notes for the guidance of those who desire to offer contributions to the JOURNAL. The following are the principal points to which attention is invited :—

(1) Preference will be given to articles which assist in the " promotion and advancement of naval and military science and literature " in practical form and which are written with an up-to-date and first-hand knowledge of the subject with which they deal.

(2) Historical articles should point some definite lesson for the present or future and not merely recapitulate accounts of episodes of the past.

(3) Articles of interest to students of war in all three Services are preferable to those of a highly technical nature or of such restricted interest that they could only appeal to a very limited number of our readers.

(4) Authors should be careful to avoid confidential matter.

(5) As a general rule articles should not exceed 3,000 words in length. Apart from considerations of space, experience shows that the short article which makes its points concisely is more effective and more widely read than one of a long and rambling character.

(6) Contributions intended for the JOURNAL should be addressed to the Editor. They should, if possible, be typed (double spacing), but short articles in legible manuscript can be accepted if a typewriter is not available.

(7) The Editor is authorized to obtain official sanction for the publication of articles written by serving officers; it must be clearly understood that nothing written by such officers can be accepted for the JOURNAL without this sanction being obtained.

(8) Except where contributors are good enough to offer articles without remuneration, this will be paid at the authorized rates.

(9) Attention is invited to the note on the first page of each JOURNAL regarding authors alone being responsible for their opinions: also to the notice at the head of "Correspondence."

LIBRARY

Facilities for Borrowing Books

The special attention of Members who are now paying the new annual subscription of £1 5s. od., is invited to the fact that they are thereby entitled to the full privileges of the Lending Library without further charge. These include the right to have sent to them not more than four volumes at a time on loan, the Member paying postage both ways.

Old Members who have not wished to conform to the new arrangement and who are still paying the original subscription of £1 1s. od., must pay an additional subscription of 10/- per annum in order to belong to the Lending Library.

All Members are, of course, free to use the Library when they visit the Institution.

MUSEUM

Collection of Medals

The Institution having had to surrender the Cheylesmore Collection of Medals at the request of the Trustees, the Council are desirous of forming a new collection which will be a permanent feature in the Museum. The Institution already possesses a large and varied collection of medals which are being grouped together, but offers of additions to the collection will be most welcome. Details of such offers should however be communicated before medals are sent.

Portrait of Nelson

The Museum Committee are anxious to acquire a good portrait in oils of Admiral Lord Nelson.

Regimental Badges and Buttons

It is desired to complete the Institution's Collection of Regimental Badges and Buttons, including those of the Regular units, Militia and Volunteers.

Members who can make contributions to the collection are requested to communicate particulars to the Curator, who will inform them whether the Badges or Buttons offered are already in the collection.

Additions

PERMANENT.

(8332) Full-dress helmet of the Lothian and Berwickshire Yeomanry Cavalry. Presented by Surgeon Commander J. B. Ronaldson, V.D.

(8333) Remington Carbine captured by the Dervishes when Hicks Pasha's Force was annihilated in 1883, and recaptured from Nuba tribesmen by the Camel Corps on the 5th January, 1930, at Jebel Elire. Presented by Lieutenant W. V. Makins, Welsh Guards.

(8334) Scimitar surrendered by the Dey of Tunis to Lord Nelson after the Battle of the Nile.—Presented by Vice-Admiral E. G. Lowther-Crofton, D.S.O.

(8335) Two miniatures: Ranjit Singh, Maharaja of the Punjab, who died in 1838; and Nawab Moonluzim ood dowlah Mehdee Khan Bahadoor, Prime Minister at Lucknow in 1836.—Presented by Miss U. Law.

(8336) Silver and tortoiseshell snuff box commemorative of the Battle of Waterloo.—Presented by Her Majesty the Queen.

(8337) Collection of weapons, including Russian, Japanese, French and American rifles used against us by the Bolsheviks on the North Dwina Front in 1919, and two Russian swords.
Head of a shell fired by the 15-inch gun erected by the Germans at Leugenboom to bombard Dunkerque during the Great War.—Presented by Captain E. Altham, C.B., R.N.

(8338) Link of the old iron chain constructed in 1522 to keep hostile ships out of Portsmouth Harbour.—Presented by The Lords Commissioners of the Admiralty.

LOAN

(3583) Coloured engraving of the Battle of the Nile.—Deposited by Rear-Admiral The Hon. A. Stopford, C.M.G.

Attendance

The amount taken for admission during the past Quarter was :—

£140 4s. 0d. in May.

£154 17s. 0d. in June.

£205 6s. 0d. in July.

Purchase Fund

This Fund has been opened to assist in the purchase of new exhibits. The Council hope that it will receive the support of Members interested in the Museum.

	£	s.	d.
Balance in hand	6	12	3
"C. A. B. P."	1	1	0
"Anonymous"	10	0	0
Proceeds of sale of surplus exhibits ..	25	0	0
	42	13	3
Purchased :—			
Model of a Mark II Tank	20	0	0
	£22	13	3

THE FIRST H.M.S. "EXCELLENT"

(From the picture by Harold Wyllie ; reproduced from the "History of H.M.S. 'Excellent,'" by courtesy of the Captain and Officers of the R.N. Gunnery School, Whale Island, Portsmouth).

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OF THE
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[Authors alone are responsible for the contents of their respective Papers. All communications (except those for perusal by the Editor only) should be addressed to the Secretary, Royal United Service Institution.]

THE CENTENARY OF THE FIRST NAVAL GUNNERY SCHOOL

" Si Vis Pacem Para Bellum."

THE Centenary of the Royal Naval Gunnery School, H.M.S. " Excellent " at Portsmouth, is an event of interest to all three Services. Although the establishment which started a hundred years ago on board a wooden line-of-battle ship and is now ashore at Whale Island, is primarily celebrated as the home and inspiration of naval gunnery, yet it has for many years, and especially in the War, been closely associated with artillery, machine gun, and ordnance developments in all the Services.

With the advent of the tank, problems which had hitherto been confined to fighting afloat became the concern of a new branch of the Army. The training of tank gunners originated at Whale Island, and nearly 2,000 ratings were trained there for the Tank Corps before the Tank Gunnery School was founded. To commemorate this service the War Office presented the Island with a Mark IV male tank.

In 1915 anti-aircraft guns were mounted on the Island as part of the defences of Portsmouth and the first gun was manned by the Royal Artillery.

Aerial gunnery was assisted by a special course for R.N.A.S. officers; while observation of fire from aircraft of all kinds was developed in close association with the system of fire control taught at Whale Island.

But the link between the first H.M.S. " Excellent "—which was also the first Naval Gunnery School—and a sister Service goes back more than a hundred years. Over thirty years before the old hulk " Excellent " was selected " for the practice of Sea Gunnery and for the Instruction of the Gunners and others belonging to the Sea Service desirous of availing themselves of it, at the Port of Portsmouth,"[1] that same ship, in all her brave array as a 74-gun ship of the line, was one of Sir John Jervis' fleet, and fought and greatly distinguished herself, at the battle of St. Vincent. In an account of the action by an eye-witness, published in the new " History of H.M.S. ' Excellent,' 1830-1930 "[2] there is a vivid description of the scene at the height of the engagement. Nelson, in the " Captain "—the writer's ship—had broken out of the line to attack the Spanish rear and the " Excellent," commanded by Collingwood, had followed to support him. " At this time," runs the account, " we were hard at it with three first-rates. The ' San Nicholas ' and two other vessels were firing into us, and we were, of course, returning them as much iron for use as we could spare. It was then that Collingwood, who never forgot a friend nor spared an enemy . . . came up, man-of-war fashion, took the mainsail off the ' Excellent,' as if he were going to dine with the Admiral, and, passing within ten feet of the ' San Nicholas,' poured in such a broadside as nearly to send her to Old Nick—after whom, I believe, she was named. . . . Nelson ordered the Captain to put the helm a-starboard, and we ran on board the ' San Nicholas.' ' Boarders fore and aft ' was the cry . . . . Captain Berry led the way and was the first man on the enemy's mizzen chains . . . He was not a second without a supporter ; for Lieutenant Pierson, who commanded a detachment of the 69th Regiment,[3] then doing duty on board as Marines, gallantly followed the noble example, and passed into the ' San Nicholas ' . . . One of the soldiers broke the galley window and jumped in ; and the Commodore and myself were soon at his heels."

Writing to Collingwood the day after the battle, Nelson said " My dearest Friend—' A friend in need is a friend indeed,' was never more truly verified than by your most noble and gallant conduct yesterday in sparing the ' Captain ' from further loss ; . . . I have not failed, by letter to the Admiral, to represent the eminent services of the 'Excellent' . . . but I could not come near you without assuring you how sensible I am of your assistance in a nearly critical situation."

---

[1] Board Minute of 19th June, 1830.

[2] " H.M.S. ' Excellent,' " 1830-1930, compiled by Commander R. D. Oliver, D.S.C., R.N. (Charpentier, Ltd., Portsmouth). 5s.

[3] Originally raised in 1756 as " Colville's Foot," this was at the time the South Lincolnshire Regiment ; it was amalgamated in 1881 with the 41st Foot to form the Welsh Regiment.

This fine old ship was cut down in 1820 to 58 guns, and ten years later, when already forty-three years old, she was selected as the vessel to be supplied with " a gun and carriage of each description now in use in the Navy, with different kinds of sights, and the whole of the material appertaining to this Department, and every invention relating to gunnery thought worth a trial."[1] So there came to be founded the first Naval Gunnery School.

The original " Excellent " was broken up at Deptford in 1835, but her mission was carried on by a second ship of that name. Originally called the " Boyne," the next " Excellent " was a 98-gun ship built at Portsmouth in 1810, to the plans of Nelson's " Victory." She was broken up in 1861, and was succeeded by a third ship which was originally the " Queen Charlotte." This was the second ship of that name; it was the first " Queen Charlotte " which led the line in Howe's famous victory of the " Glorious First of June." But the third " Excellent " carried on the traditions she had inherited as the " Queen Charlotte," and with them the link with the 2nd Queen's Royal Regiment which fought in Howe's flagship on that great occasion. Most cordial relations have been maintained between the Naval Gunnery School and the Queen's Regiment up to the present day.

In 1861 the establishment increased so much in size that a second ship, the " Illustrious," had to be added. Four years later, having become unserviceable, that ship was replaced by the " Calcutta."

An event, destined to prove of considerable importance, took place in 1856, when the Admiralty purchased for £1,000 two small islands, composed chiefly of mud, to the northward of Portsmouth Dockyard. At high water the larger of the two had the appearance of a whale's back and the oldest charts mark them as " Waley," the name by which Whale Island is known to-day, throughout the Navy. At first the larger island only was used, and parties of men were landed there for rifle drill; but gradually the site was developed. In about 1864 considerable extension works were undertaken in the dockyard and part of the material dug out for new docks and basins was used to reclaim the land between the two islands, the labour being supplied by convicts. In that year, too, the first house was built on the island by the seamen of the " Excellent " for a resident Gunner.

The next twenty-five years saw many extensions and developments; the latter included heavy gun and machine gun instructional batteries. Eventually, in 1888, permanent barracks were started, and in 1891,

[1] " Prospectus of a Plan for the Improvement of Naval Gunnery without any Additional Expense." Presented to the Admiralty in October, 1829. By Commander George Smith, R.N.

the Gunnery School finally left its home afloat and was transferred to Whale Island. Since then various tenders and small craft have borne the name of " Excellent," by which the establishment is still known officially. One of these, the fifth " Excellent," an old " flat-iron " gunboat originally called the " Drudge," saw service soon after the outbreak of the Great War. She was hurriedly despatched to the Belgian Coast in October, 1914, and was for some time hotly engaged in company with the flotilla which was supporting the Belgian Army against the German advance on the Channel ports. It was that flotilla of which the General at the head of the British Mission said at a certain critical time, " it is the ships and nothing but the ships which are saving the situation."

No commemoration of this Centenary would be complete without recalling the names of famous men who attained one of the blue-ribbons of the Service as Captain of the " Excellent." From Commander George Smith, the first commanding officer,[1] and Captain Sir Thomas Hastings, who succeeded him when the " Excellent " became a separate command, we find them recorded during the next hundred years: Chads, Cooper-Key, Ackland Hood, Herbert, Fisher, Domvile, May, Scott, Hamilton, are some of those who left their mark, not only on naval gunnery, but in greater or less degree on the Navy as a whole.

In the new " History " which makes a most timely and attractive appearance, Commander Oliver weaves much of the story of the hundred years of training in naval gunnery around the personalities of the successive commanding officers in the form of short biographies. To tell the whole story of the development of the Gunnery School would mean paying tribute to a long roll of others: Commanders, First Lieutenants, Staff Officers, Warrant Officers and the invaluable Petty-Officer instructors.

But whether it be the Gunnery officers past and present, who gathered round the mess-table for the great re-union on the 1st August, or those others serving afloat all over the world, or whether it be the multitude of naval officers and men who have been trained there, or the officers and other ranks of the sister Services who have been welcome visitors to the Island, they can scarcely fail to appreciate that this is no ordinary Centenary, for they cannot but realise that " Waley " holds a very exceptional place in the heart of the Navy, even as it plays and has always played, a very exceptional part in promoting the fighting efficiency of the Service.

[1] Appointed Supernumerary Commander to the Flagship, " Portsmouth," but for charge of, and ordered to reside in, H.M.S. " Excellent."

THE CO-ORDINATION OF THE FIGHTING SERVICES

By Wing Commander Sir Norman R. A. D. Leslie, Bart., C.M.G., C.B.E., *p.s.a.*, R.A.F. (Retd.)

ALTHOUGH the dictates of economy and the general desire to promote disarmament are combining to secure a progressive contraction of the fighting Services, the insurance premium for Imperial Defence in the form of Navy, Army and Air Force votes still has to be paid. It is only natural that there should be some anxiety on the part of the public as to whether the best insurance policy is being effected in return for this premium. In this connection attention is inevitably focused on the fact that there are now three Services, each with its own Minister, its own independent headquarter organization, and, to some extent, its own separate ancillary services. Such an arrangement, it is argued, inevitably implies overlapping of responsibilities, duplication of staffs and the maintenance of redundant establishments. In fact it is felt that the " Insurance Company " is badly organized, that overhead charges absorb an undue proportion of the premium receipts, and that greater benefits could be realized by reorganization and reconstruction of the whole concern.

In these days of rationalization there is a general feeling that economy combined with efficiency could be obtained by some form of merger of the three fighting Services, and in consequence the creation of a single Ministry of Defence is advocated and receives considerable support from many quarters.

But what exactly is implied by such a Ministry? The views put forward are for the most part vague. They appear to contemplate the placing of the three Services under one Cabinet Minister, who will then, by some process of magic which is not defined or even examined, proceed to mould the three Services into one harmonious whole. Yet, because there is one Minister it does not necessarily follow that there will be one Service. Rationalization in commerce and industry is not secured merely by the appointment of a common Chairman; it is accompanied by the creation of a common staff to consider and frame a single policy for the combined undertakings.

What is the position in this respect in the Services to-day? Just as there are three Services, there are also three Staffs—the Naval, the General, and the Air Staff—to deal with questions of policy concerning the Navy, the Army and the Air Force respectively. Each of these Staffs has its Chief who is responsible to his own Board or Council in regard to matters which fall within the scope of his office.

It must not be thought, however, that each of these Staffs works in splendid isolation. Since the war much has been done to secure inter-staff consultation and inter-departmental co-operation. Chief among these is the creation of the Chiefs of Staff Committee—a Sub-Committee of the Committee of Imperial Defence—which was followed shortly afterwards by the issue of a Warrant to each of the three holders of this office. This Warrant defines the duties and responsibilities which are placed on the three Chiefs of Staff, and in effect throws upon each of them a dual responsibility. That due to his own Board or Council remains unimpaired, but each is charged in addition with a responsibility towards the Chairman of the Chiefs of Staff Committee (the Prime Minister or his nominee), and to his colleagues on the Committee, in respect of all matters affecting defence questions generally. For the discharge of these latter duties the Chiefs of Staff meet together from time to time and after consultation submit reports to the Government.

The machinery thus created marks a great advance in the way of consultation, co-ordination and co-operation, and works admirably when the Committee, as the result of its deliberations, is able to arrive at unanimous conclusions. But is it likely that the three individuals composing the Committee will always, or indeed often, be able to arrive at a single opinion? And what happens if they disagree? It must be remembered that each of the three Chiefs of Staff has been brought up in a particular school of thought. Since he first entered the Service he has been soaked in the traditions of that Service. For the whole of his career he has been taught to think in terms of his own Service, and to believe implicitly in its efficacy for carrying out all tasks which can reasonably be laid upon it. And after thirty to forty years of such environment and training he has arrived at a position of supreme responsibility where his decisions may be fraught with far-reaching consequences to his country and may affect the welfare and the future of numbers who are serving under him. It is at this stage that he may be faced with the dilemma of either disagreeing with his colleagues or of surrendering his own judgment for the sake of agreement. If he falls in with the views of his colleagues he not only identifies himself with the plans which they favour, but makes himself responsible also for putting into execution that part of those plans which falls to the lot of his own Service. In other words, he takes upon himself the direction of a plan in which, *ex hypothesi*, he has no great faith. If he adheres to his own views he retains for himself complete liberty of action, and, in the event of his advice not being accepted, he can resign his appointment if he thinks such a step to be justified; but the unity of the Chiefs of Staff Committee will be broken. In these circumstances what course is he likely to adopt? Surely it is not unreasonable to assume that cases will inevitably arise from time to time when one of the three Chiefs

will feel that it is his bounden duty to adhere to his own views. And the greater the crisis, or the greater the issue at stake, the more rigid is likely to be his adherence.

Nevertheless, a decision has to be taken, and so the two, or possibly three, views are put before the Government of the day, who have to choose between them. Thus a decision on what is a purely military matter (using the term in its widest sense) is transferred from a body, the members of which have made such matters their life study, to a body whose primary business is politics. Faced with such a situation the Minister or Ministers concerned will probably first seek to effect a compromise. But compromises are notoriously dangerous in war. Failing a compromise they must choose one of the courses recommended to them, and the chances are that, not being qualified to gauge the situation accurately, their choice will be governed mainly by the force of character of the protagonists of the different points of view rather than the intrinsic merits of the cases. In other words, the decision will at times be taken not on sound reasoning but on personalities.

To avoid such a contingency obviously there should be a system which would provide that decisions in regard to matters which are of a purely strategical character should rest on advice tendered by those who have had the opportunity of making a life-long study of the art of war. And further, that in formulating these decisions, the Government should be able to rely on a single opinion, and should not be placed in the invidious position of having to choose between conflicting views. In other words, differences of opinion in regard to any particular line of action should be examined by those who are competent to weigh the merits, and one of their number should be placed in a position to decide which one of the various courses proposed shall be recommended to the Government.

The responsibilities which would be imposed on this individual would necessarily be very great. Upon his judgment vital issues would depend. Not only must his views carry weight with the members of the Government, but also his decisions must command the respect and whole-hearted support of the three Services over whose activities he has been set up to preside. Obviously, his selection must not be regarded as a purely political appointment. If his dictum is to be accepted by all the interests concerned and his authority is to be commensurate with the tremendous responsibilities laid upon him, his emergence and ultimate selection must be the product of a system and not merely the outcome of chance.

It so happens that a promising step in this direction has already been taken. In 1926 the late Government decided to establish the Imperial Defence College, where selected representatives of each of the three fighting Services, of the Civil Service, and of the Forces of the

Dominions should graduate in the study of war as a whole. The students—approximately twenty in number—who undergo this course are, presumably, selected from among those who have qualified at their respective Staff Colleges and have given some indication that they appreciate the kind of problems involved in questions of grand strategy. In fact, they are those who, in the normal course of their profession, may be expected to rise to the highest ranks. The material, therefore, is probably the best that can be obtained from among the personnel of the three Services, and up to this point their nomination may be said to be the product of a system.

But the average age of the students going through this course is approximately forty, and, therefore, in normal circumstances, some twelve to fifteen years must elapse before any of them can attain to a position where they will be required to make decisions in regard to matters of the kind which they have studied while at the Imperial Defence College. During these twelve to fifteen years they revert to duty with their own particular Service, where they are given periods of command over units of progressively increasing size and importance, punctuated by Staff appointments of various kinds. Throughout this intervening time their interests and activities are again centred in their own Service, and the wide outlook acquired at the Imperial Defence College is in danger of again being contracted within narrow limits. During their periods of command they are seldom brought into contact with either of the other two Services, while during their appointments on the Staff they are often employed in the preparation of cases and compilation of arguments in support of the employment of their own particular Service for a certain task and in refutation of the claims of one or both of the other two Services. In fact, the period of incubation, through which an officer passes before he emerges as Chief of Staff of his own Service, is largely spent in an atmosphere of partisanship, which cannot but colour his outlook and affect his judgment. Such a set of conditions can, only in the most exceptional cases, produce a man qualified to act as a Chief of Staff over all three Services. Even if he were able to raise himself above his circumstances, the record of his past would alienate the sympathies and undermine the confidence of those over whose destinies he would be called upon to preside.

It seems clear, therefore, that the arrangements as they exist to-day do not provide a system which will produce a series of individuals qualified to act as a supreme Chief of Staff for all three Services. Progress towards this end has undoubtedly been made, but the evolutionary process must now be carried a stage further.

With this object in view it is suggested that steps should be taken to select from among the candidates graduating at the Imperial Defence College, irrespective of the Service to which they belong, those who,

in the opinion of the Commandant and his staff, have the requisite qualities to become, given suitable environment and experience, a supreme head of all three Services. The officers thus selected should be placed on a special list, and it should be made quite clear that their future lies on this list, and not with their respective parent Services. In this way vested interest and personal prejudice would be, to a large extent, eliminated at a stage in their careers when their minds are still receptive to new ideas and their opinions have not formed in set channels.

There will thus be created a " Combined Staff " drawn from all three Services, trained to view military matters from a wide angle and yet able to bring to the study of any particular problem every variety of military experience. With the creation of such a Staff the structure of our defence system might be likened to a tripod with telescopic legs supporting an instrument which, in order to gauge and register its measurements accurately, must be maintained in a level position. The tripod can then be set up wherever required, inequalities in the ground being compensated by adjustments in the lengths of the legs. In this simile the legs are, of course, the Navy, Army and Air Force respectively, while the instrument is the " Combined Staff."

There is in this suggestion the well-recognized danger that officers of the " Combined Staff " may become wholly academic in their outlook and divorced from the practical work of the three Services. This could be guarded against by the adoption of a system whereby they would be appointed from time to time to suitable posts with units, not only of their own Service, but of the other two Services as well, and whereby, while so employed, they would be treated and reported upon in exactly the same way as officers of the Service to which they are attached.

They should also be considered as eligible for responsible commands which, other than in exceptional circumstances, would be usually within their own parent Service for obvious reasons. While not employed with units they should serve in staff billets in the Admiralty, War Office and Air Ministry without regard to their original Service, on the directing staffs of the Imperial Defence College, and the three Staff Colleges, and on the Secretariat of the Committee of Imperial Defence. In this way they would be given further opportunities of viewing military problems from every aspect, and would be kept in touch with current thought and practice within each of the three Services.

When a " Combined Staff," such as is here visualized, is in being there will be a body of disinterested and unbiased opinion to consider matters affecting defence questions generally, which can appreciate from a professional standpoint the relative suitability of each Service for a particular task, and the extent to which one Service can supplement or relieve another of some of its duties. As a result, in the administrative

field economies should follow without loss of security, while in the strategical sphere effective combined action on the part of all three Services should be obtained. Indeed, is it too much to assume that, had such a Staff been in existence, there would have been no such sorry tale to tell as that relating to the Dardanelles, where a great strategical conception was deprived of success by faulty execution, independent action and lack of co-operation, in fact by the absence of centralized control?

Admittedly, immediate results cannot be expected from the adoption of the system here suggested. Time must elapse before the "Combined Staff" will include an adequate number of members of sufficient seniority to exert an appreciable influence. But its strength and importance will increase year by year, and though the creation of a supreme Chief of Staff cannot be an accomplished fact for twelve to fifteen years, the benefits of the scheme will begin to be felt much earlier. At the end of this time there will be in existence not only a body of professional opinion trained to examine and appreciate every kind of military problem, but also there will be a responsible head well qualified to choose between alternative proposals and to recommend a single course of action to the Government. In this way Ministers will be relieved of the invidious task of adjudicating between rival claims, the intrinsic merits of which they are unable to gauge; decisions will be based on knowledge and not groped after in the dark; the whole machinery of control will be simplified and the principle of unity of direction will be established.

It is realized that many objections can be raised to this scheme, and it may be as well to anticipate some of them. In the first place it will probably be urged that there will be considerable difficulty in bringing together in one list officers drawn from three separate Services where different conditions of appointment and promotion obtain. No doubt there will be difficulties, but these should not prove insurmountable. For example, officers drawn from a number of sources, including the Navy and the Army, with very different conditions of service and employment were brought together in one list when the Royal Air Force was formed.

Secondly, it will probably be argued that the training and experience of Navy, Army and Air Force officers are so different that it will not be possible for officers from one Service to be able to appreciate and master the technicalities of either of the other two Services, and that, therefore, the "Combined Staff" will not be able to fulfil the duties laid upon it. To this it may be replied that the main principles of strategy are identical for all three Services, and that it is with the strategical employment of the fighting forces that the "Combined Staff" will be required to deal. The application of these principles may no doubt vary with different sets of conditions, but the "Combined Staff" will include officers drawn from each of the three Services, and these should always

be able to bring the requisite experience and knowledge to bear on any particular problem.

Thirdly, it will probably be pointed out that for more than a decade the "Combined Staff" will be without a responsible head to direct their work and lay down a common doctrine, and would in effect prove to be a dangerous innovation. But this difficulty could be overcome by placing the "Combined Staff" under the control of the triumvirate which composes the Chiefs of Staff Committee, each member of which, before appointment, should be required to give an undertaking that during the tenure of his office he will use his best endeavours to promote and foster the development of the scheme. If this were done the position certainly would be no worse and no more dangerous than it is to-day.

Once a "Combined Staff" has been created and is in operation it is reasonable to assume that other developments will follow. It may so be that, eventually, all three Services will be merged into one, and, if this should prove practicable, a single Ministry of Defence would inevitably ensue. But it is idle to speculate at the present time on what may happen fifteen to twenty years hence. Experience alone will show the best course to adopt, and such experience is not yet available.

But whether there be a "Combined Staff," or a single Service and a single Ministry, there will always have to be a Committee of Imperial Defence. War, as the latest experience conclusively proved, is not the concern of the fighting Services only. It intimately affects the whole nation, and, in consequence, every single Department of Government. The work of co-ordination between these Departments will in no way be diminished because the forces of the Crown have one instead of three spokesmen in the councils of the State. All it means is that one side—the purely military side—of war will have been organized.

What may be termed the "civil side" of war cannot be ignored. Here the elements are so diverse that no question of amalgamation seems possible, and yet each part must be so arranged that the whole will act as one body should the need arise. This is essentially a case for co-ordination. In addition there are the two cognate questions of industrial mobilization and man-power, which cannot be adequately tackled without the co-operation of leaders in industry and commerce, employers of labour, and officials of labour organizations. But these are subjects in themselves, and outside the scope of the present article.

In the whole field of "co-ordination" for war, not only in its military but also in its civil aspects, the Committee of Imperial Defence has achieved much, and the nation owes a deep debt of gratitude to its inspiring genius. There is still, however, an enormous area lying fallow and waiting to be cultivated, for which work the elasticity of the organization of the Committee is admirably suited.

SECOND PRIZE ESSAY (AIR) FOR 1929

SUBJECT:

"The Role of Aircraft in Coast Defence"

By Brigadier-General H. Rowan Robinson, C.M.G., D.S.O.

I. OBJECTS OF COAST DEFENCE.

COAST defence has two main objects. The first is to secure the various portions of the Empire, especially the principal ports and their contents, against invasion and damage, so that the fleet, having no anxiety on that score, may move its frontier to the enemy's shores, untrammelled in its strategic plans by the need for static defence measures. The second is to provide for the safety of the various naval bases and defended ports along the sea-communications of the Empire, the loss of which would deprive the Navy of the power both of distant action and of securing the transit of supplies. Whatever the means employed to attain these objects, they cannot be regarded as satisfactory if they are extravagant in men and materials.

II. ATTACKS AGAINST COAST DEFENCES.

In carrying out their tasks the defenders may have to deal with enemy action in the following forms:—

(1) Invasion on a big scale, such as that anticipated in our eastern counties in the Great War;
(2) The seizure of a harbour or a beach-head, as for example at Port Arthur, as a base for further operations, or, as at Louisbourg, to deprive the enemy of a maritime base at a valuable strategic point;
(3) The forcing of a passage, as at the Dardanelles;
(4) Major operations for the destruction of warships, docks, oil depots and magazines, inside defended coastal areas, as at the Helder in 1799;
(5) Blocking attacks, as at Zeebrugge;
(6) Minor operations executed by submarines, torpedo craft and coastal motor-boats, as in the Sea of Marmora and Gulf of Finland;
(7) Raids, as at Hartlepool, executed with the object either of creating panic or causing alterations in dispositions;
(8) Mine-sweeping and mine-laying near harbour entrances;
(9) Raids by aircraft.

In the first four of these categories the attacker has generally employed combined forces of all the arms available; and, in the remainder, he has used his navy or air force either apart or in combination as conditions demanded.

History indicates that, unless executed by naval and military forces acting in unison, major operations against coast defences are foredoomed to failure. Minor operations undertaken by a navy alone, such as the attacks of coastal motor-boats in the Gulf of Finland and those of torpedo-boats at Port Arthur, have, of course, often proved successful, but only in a limited sphere. When a navy alone has attempted major operations against coast fortresses the issue has been seldom in doubt. The land gun, with all the advantages of a steady platform, distant control, accurate range finding installations, protection, concealment, and an unlimited supply of ammunition has always been the superior of the ship's gun. When, on the other hand, a combination of naval and land forces has been employed under favourable conditions, and when leadership has been skilful and co-operation good, fortresses have usually fallen. A further postulate is the command of the sea, without which ships cannot be spared for the operation, nor an army be transported and maintained.

If we study the methods by which an assailant conducts his attacks, it will generally be found that he divides them into two distinct operations, in one of which the fleet acts directly against the harbour and, in the other, the army disembarks at a point some miles distant so as to move against the land side of the fortress. The operations round Port Arthur furnish a good example of this, for the army landed some seventy miles from the harbour against which the fleet was operating. The action of a fleet lies in securing control of the sea, in blockade or in bottling up ships in harbour, rather than in any direct attack on shore objectives. Decisive results against the latter have usually been achieved by the army. In modern days, when the two operations will be assisted and co-ordinated by aircraft, it remains to be seen whether this condition will still hold; and, indeed, whether or not all three Services are always needed.

The Place of Aircraft in the Attack.

We have but little direct experience to guide us as to the worth of aircraft in coastal attack operations, for they have as yet played no big part therein. At the time of the Dardanelles landings they were still in their infancy, and, in the Zeebrugge raid, naval work strongly predominated. Their value in this connexion has to be estimated from a study of their work in other spheres, from reports of their technical progress since 1918, and from the obvious fact that neither a navy nor an army can operate satisfactorily in modern warfare without them.

We do know, however, that the conditions under which they may have to act in the attack are not always favourable to the development of their full capacity. The aeroplanes which are most powerful in relation to their weight are those equipped to work from land aerodromes. On the other hand, aircraft carriers are very vulnerable to attack, both from the air and the sea; and seaplanes, flying boats, amphibians, and aeroplanes launched from aircraft carriers and other warships all suffer from disabilities, either as to speed, ceiling or handiness. Nevertheless, they have to be employed unless the coast of the assailant, or other land in his possession, is in close proximity to that of the defender. Therefore, plane for plane, the defender will generally have over his adversary an advantage which will go far to cancel any numerical superiority the latter may possess, and this advantage will naturally grow in proportion to the length of the assailant's stroke.

Strategic surprise has seldom been achieved, since preparations for a major operation can hardly be concealed. And now tactical surprise becomes nearly as difficult, because the early concentration having been observed, the movements of hostile ships can often be followed from the air unless the assailant's base is very near. The mobility of aircraft thus enables the defender to concentrate all his available planes at the threatened point. It follows that the assailant cannot hope to achieve the necessary local superiority unless he has previously attained a marked dominance in the air, if not throughout the theatre of war, then at least over a wide area.

Judging from experience, it would appear that a major operation against coast defences, involving the actual capture of the fortress, is unlikely to be initiated by an assailant unless he is able to launch from fairly short range a combined expedition, containing navy, army and air force units in their correct proportion, at a time when he has command of the sea and a marked superiority in the air, not only local but general. These conditions will naturally become of less importance as the operations shrink from the major to the minor category.

If, however, it could be shewn that a fleet and air force combined, unencumbered with an army and all its paraphernalia, would suffice, not indeed for the capture of the fortress but for the fulfilment of the task most commonly involved, namely, the destruction of ships and establishments in harbour, the chances of effecting surprise would be greatly enhanced, and operations of this nature might be undertaken far more readily. Such an issue might have a profound effect on naval warfare, because attacks of this type, even if they failed to destroy the enemy's fleet, would certainly force him to a radical alteration of his basic strategy. In addition, there would be no security in any protected

commercial port. There must, therefore, be a great temptation to adopt such a method. Whatever the method, however, it will be convenient to consider attacks from the sea on coast fortresses, and attempts at landing separately, though each may form part of a single combined operation.

Attacks on Defended Harbours.

It may be presumed that, in whatever position a fleet may anchor to bombard, the area chosen will be within range of the fortress guns. In fact, guns are usually so sited as to be well in advance of the targets an enemy would seek to destroy, and so have the advantage in range. To protect themselves against the fate that has hitherto so often befallen them, the ships will, therefore, in all probability, put up a smoke screen while in action, having first fixed their position as accurately as possible for predicted shooting. They will fire through the screen, and, if they can get observation, will probably obtain valuable results; but, if not, the effect will be moderate. Ships will, therefore, in ordinary circumstances, have to depend on their airmen for the efficacy of their bombardment; and it follows that, unless the assailant has local superiority in the air, the ships' gunfire will be of no avail. Moreover, the superiority needs to be so great as not only to ensure observation of the ships' fire, but to deny air observation to the enemy. An even wider margin will clearly be necessary if air attacks are to be combined with sea attacks.

In attempts to block harbours, the assailant will lay special stress on surprise, and will, if possible, initiate and complete his work by night, employing his aircraft to lay smoke screens, and also perhaps to attack the defender's guns.

Landing Operations.

As the defender cannot possibly guard his whole coastline strongly, the assailant, if operating from a short range, might hope, by secret preparations and rapid action, to effect a surprise and thus find his chosen point of disembarkation lightly held. Initiated in the dark, the operation could be continued by day under cover of a smoke screen laid by planes along the shore. Then, supported by the fleet and lightly opposed by hostile fire, it might, if well combined, be expected to meet with success, provided hydrographic, topographic and meteorologic conditions were all favourable. A quick landing, the early formation of a beach-head and the organization by warships of covering fire beyond the forward troops complete the first stage of the operation. Superiority in the air will be of great value, as it will simplify for the assailant the difficulties of preliminary reconnaissance, and will enable him, prior to disembarkation, not only to watch the movements of the enemy, but

also by photography to discover all his preparations for defence and bring maps of the coast up to date. It will, moreover, give him air observation for ships' gunfire; and this is particularly important since high angle fire has been introduced and reverse slopes can be searched. Finally, it should enable him to impose heavy casualties and a considerable delay on reinforcements despatched by the defender from his central reserve to the selected landing point.

Minor Attacks.

In minor operations such as raids, harbour-blocking, and mine-sweeping, aircraft will not be of noteworthy assistance to the attacker except for reconnaissance, searching for submarines and observation of fire.

III. THE DEFENCE—SHORT-RANGE EXPEDITIONS.

Organization.

The usual organization for defence, except in isolated naval bases, is the division of a country into Commands containing, firstly, field troops of all arms distributed in peace in training centres but available for any threatened point in war. Secondly, the Command generally contains a number of Coastal Sectors, each held by troops, both field and garrison, and including one or more defended harbours with their contingent areas. And, finally, there is the Coast-fortress or Defended Harbour, manned solely by garrison troops. Where, as with us, a separate Air Service exists, air units are supplied by the Air Ministry on a basis calculated according to requirements by the Services concerned.

Again, it will be convenient to divide harbour from shore defence, for, apart from the fact that the two areas are, as pointed out above, usually subjected to separate attack, the forms of defence are sharply differentiated by the nature of action, the one static, the other mobile, by the troops employed—the one garrison and the other field—and by their relative capacity for dealing with aircraft.

Present Position of Harbour Defence.

The present position of harbour defence is that the Navy, Army and Air Force work together under a commander usually chosen from the Army. The part played by the Navy is comparatively small, for naval action is always either directly offensive or potentially so. No portion of it that is available, or that would be useful in a fleet action, is allowed to remain in port for defensive purposes. Its coastal duties are limited to the protective use of mines, booms, and nets, and to the employment of light craft for reconnaissance and patrol work; though, where any units of a fleet are present during an attack, they naturally take part in the action to the limit of their capacity in combination

with the land forces. The Army provides the garrison, which consists of gunners to fight the coast and A.A. guns, engineers to work the searchlights, and infantry to man the land defences and to repel minor attacks on the harbour. The Air Force does not normally form part of the garrison except at large stations abroad, and in some foreign coast fortresses, but is provided, as needed for ranging guns, from outside sources. The form that air attack on warships may be normally expected to take is that of a smoke screen dropped to windward, followed by a bombing attack at a low height as the screen floats over the vessel. Such an attack may often be effective, but the power to deliver it presumes either equality or superiority on the part of the defender's aircraft: conditions which, as has already been indicated, would *per se* rule out the hostile adventure. Airships, as proved by the Germans in the Bight of Heligoland, are of special value for reconnaissance, and almost preclude surprise except in the case of attacks delivered from a very short range.

The armament of the fortress consists, firstly, of heavy guns on fixed mountings, relatively few in number and inferior in power to the weapons that may be brought against them, but with the compensating qualities already indicated; secondly, of light guns assisted by searchlights for dealing with hostile raiding craft; thirdly, of heavy mobile guns and howitzers suitable either for mobile or static defence; and lastly, of anti-aircraft guns.

For defence against landings every Command and Coastal Sector has some form of defence scheme intended to deal with probable contingencies, utilizing for this purpose all available field troops and heavy batteries, and arranging for the co-operation of aircraft.

Anti-Aircraft Guns.

Hitherto the problem of fort gun versus ship only has been discussed, and no value has been assigned to the A.A. gun, a weapon that will certainly play a conspicuous role in any such operation in the future.

In many directions the sciences of gunnery and war mechanics have made but little progress since 1918. But in A.A. gunnery a truly remarkable advance has been effected. From being a laughing-stock for many years in France, it has risen to such a standard of accuracy that any aircraft flying below 15,000 feet will have to reckon with it seriously. In coast defence this science can reach its full development, because there it can call into use heavy metal, fixed positions, height-finders, sound-detectors, searchlights and communications; and it enjoys the further advantage that the assailant has no choice but to launch his attack directly against a comparatively small area, which may be further narrowed by the erection of balloon nets, and by guns

disposed in carefully selected positions: a very different affair from attacking vast areas such as the port and city of London.

A.A. guns will thus render both air attack and air observation difficult to the enemy, and will compel his spotting aircraft, if they wish to keep out of reach, to observe from a distance of at least four miles. Now, quite a light smoke haze, which can easily be produced and maintained, would suffice to conceal targets in harbour at that range, and the coast guns themselves would, if well camouflaged, be difficult to discover. The assailant's gunfire would, therefore, suffer considerably in effect. The defender's aeroplanes, on the other hand, though inferior in numbers, would be able to fly unchallenged in the area controlled by A.A. guns; and, though they might be some eight miles distant from the bombarding ships, observation on such targets would be relatively simple. It looks, therefore, as if the coast-gun, its effect but little disturbed by fire, will be able to pump shell as of old into the ship, whereas the latter will not only suffer from a lack of efficient observation, but also from all former disabilities. Thus the relations between attack and defence in this connection remain practically unaltered. And there is yet another point to consider. It is that, although the naval intelligence service has always been able to gauge with fair accuracy the hostile strength in fixed armaments, it can make no satisfactory forecast of the subsidiary and movable defences it will have to encounter in the shape of aircraft, submarines and mines: and the increasing efficiency of these weapons is likely to act as a progressively greater deterrent to attack.

But, in addition to a fleet attack assisted by air observation, the assailant might, as already suggested, launch an air attack on the fortress on a large scale, should the contents of the harbour and docks appear to justify the risks involved. What would be the prospects? They would certainly be improved; for the simultaneous delivery of the dual bombardment, even though inaccurate, would be very disturbing to the shore gunners. The approach of the bombers would, however, be early detected, by sight during the day, by sound detectors during the night, so that no surprise should be possible. By night, too, the area would be better illuminated than by day. If there were many warships in harbour—and such an attack could hardly be justified on other grounds—their A.A. guns would join in the battle under conditions far more favourable to them than in a sea-fight. Fighters might, indeed, accompany bombers and make their all-direction swoops, but fire could be organized to deal with that eventuality from the machine guns of the ships, the infantry and the coast gunners. The more planes in a restricted area at a time, the more shell and bullets would find billets. In fact, against a well organized coast fortress, an air attack might be expected to break down and suffer such heavy casualties that the air superiority

necessary to the execution of the enterprise as a whole might well be lost. The casualties would not, of course, be all on one side, but the advantage in this respect might incline very steeply to the defence.

If these anticipations are even approximately correct, the coast fortress as at present organized would seem to be as strong as ever against attack from the sea, even against a fleet supported by a superior air force. On the grounds of security, therefore, there is no strong case for altering our present system of harbour defence. The new arm appears to be of equal value to either side, perhaps favouring the defence slightly. In fact, the advent of aircraft, instead of effecting revolutionary changes in this branch of warfare as might have been expected, leaves matters much where they stood.

Guns or Aircraft.

It has been urged, however, that fixed armaments are obsolete, and that improvements could be effected, both as regards efficiency and economy, were aeroplanes no longer to co-operate with guns in the defence, but actually to replace them. This matter may be examined from several aspects.

In the first place, when the submarine was invented, it was thought by some, although the opinion was never strongly held in the Navy, that it might replace fixed armaments. That delusion quickly passed; and the submarine was absorbed wholly into the naval sphere. Nevertheless, it has inherent in it a strong value for coast defence, which operates automatically; and the aeroplane is in precisely the same position in this respect. Both of these weapons, by virtue of their very existence, and of the uncertainty that must prevail as to their positions and numbers, afford a wide and continual protection to coast lines. It may thus be argued by analogy that although aircraft in their existing form furnish a natural support to coast defences, they should not necessarily replace them.

In the second place, it must *prima facie* appear unnatural to allot such a role to aircraft, but although the task is essentially a defensive one, the action must be definitely offensive. Moreover, the role of defence, more particularly that of local defence, lies outside their natural sphere. Normally, they reconnoitre, they attack, and they afford distant protection. True, numerical weakness and the knowledge of the issues involved, coupled with the certainty that we shall never be the aggressor and, therefore, never possess the advantages inherent in the initiative, have driven us to give aircraft a defensive role in the protection of London. Such employment of the most mobile of all weapons is, however, clearly abnormal.

From generalities we may now get down to details. The superiority of the coast gun in action over the ship has already been indicated. Is the aeroplane equally effective? In attacking a ship it has the advantages over fixed armaments of unlimited range and arc of fire, and of being able to reconnoitre and to direct its own fire. But to draw profit therefrom it would have to leave the shelter of the A.A. guns of the fortress in the face of a superior air force and would find itself exposed not only to ships' fire, but also to a host of enemies of its own kind. With these rather doubtful credits, it has certain definite drawbacks against which to contend: when it attacks it does so under a fire most disturbing to the aim; it furnishes an easy target in launching a torpedo; bombing, it has to fly at a dangerously low altitude if it is to score hits, and it has constantly to return to its base to refill with ammunition and petrol. Therefore, it cannot strike blows as rapidly, continuously or accurately as the gun. It is, moreover, easily damaged, while it is to some extent susceptible to weather. The latter point is, however, normally of no great importance; for, where both sides are depending on aircraft for certain subsidiary services, the respective failures will cancel out. But, where one side depends on aircraft entirely for protection and the other has no vital need for them, a storm may prove decisive of the issue. Another drawback is that, on shore, the aerodrome will often furnish ships guns or aircraft with a big target, whereas gun magazines are hardly discernible.

But if we take matters not directly connected with harbour defence and the actual engagement of targets, there is much to be said for the aeroplane. It can detect submerged submarines; it can operate from the fortress against passing ships far more effectively than can the gun; it can assist in the prevention of a landing or in offensive land operations in the neighbourhood of the fortress; if the harbour is not in danger it can be employed elsewhere; in peace it can be used for combined training with other troops, whereas guns' crews are kept boxed up in a fortress to the detriment of their fitness for all other services. Most important of all, we need every aeroplane we can raise to ward off air attack against London which, though not a probable event, would be fraught with the gravest peril to our national existence. Any scheme, therefore, that would produce more aeroplanes for home defence, without loss of efficiency elsewhere and without additional cost to the taxpayer, would deserve a warm welcome. These are all factors that could count strongly towards the displacement of the gun by the plane were it possible to show—which it is not—that the two weapons were of even approximately equal defence value.

Whether or not the mobility of aircraft should count as a credit in this connexion is a point that is much debated. The armament of

coast defences is carefully adapted to the scale of attack it is likely to meet, and the guns are sited to meet all probable contingencies. There is, in fact, a constant state of readiness suited to the importance of the task. The immobility of the guns not only confers many technical benefits, but is also, in one sense, of strategic advantage, in that it enables the fleet to operate without anxiety as to its bases and line of communication. On the other hand, the mobility of the new weapon would be a constant source of anxiety to the fleet. Nor would the plan recently adumbrated by a high authority, namely, to hold distant outposts lightly and despatch reinforcements as required, either from areas not under direct attack or from central reserves, appeal to the Naval Staff, however sound it might appear superficially. In the first place, they would perceive the possibility of the loss of naval bases by a whole series of *coups de main* while temporarily depleted of protection. In the second place, they would feel that coast guns are, owing to their immobility, practically speaking, under their control, whereas the activities of aircraft would not only be outside their control, but might, with a little mismanagement, be even outside their knowledge. The result would be that the fleet would never be able to act with its traditional enterprise, for boldness is natural only when based on security. In the third place, the reinforcing aircraft might be delayed by bad weather, and they would, in any case, be new to the theatre: facts that would militate against their efficiency and effective co-operation with other fighting units. Lastly, it is notorious that commanders are prone to exaggerate either the immediate importance of their commands or the dangers threatening them. They might accordingly make strong objections to the despatch of reinforcements from their exiguous garrisons, or continual demands on the pool. Moreover, if, as may be presumed, the enemy has won air superiority, the pools will already have been seriously depleted. Hence only the actual presence in the coastal area concerned of a large number of aeroplanes would satisfy the naval requirements for security.

It is not, however, for the Admiralty to settle the matter. The Government, with whom the decision rests and which has to think imperially, might regard the mobility of aerial coast defence as a valuable asset. Guns and their crews locked up all over the world entail a dispersion of force, and can fulfil their own specific duties only. Moreover, as the political situation changes so does the need for coast defences alter, in one quarter vanishing and in another arising or becoming specially insistent; and it is almost as expensive to uproot and transfer the paraphernalia of fixed armaments as to renew them. Aircraft, on the other hand, can be transferred from place to place at inappreciable expense. Such action represents the true strategic use of force.

There is, therefore, in the matter of the value of mobility much to be said on either side; but, on the whole, the balance is more heavily weighted for the aeroplane; and, if no other point in this connexion had to be considered, the views of the Navy, sound as they are purely from its own point of view, might have to be disregarded.

There is yet another point that might be urged in favour of aircraft. Coast defences are, of course, only required if there exists a danger of attack. And it has been shown that there is no such danger unless the opponent has command of sea and superiority in the air. We are always aiming at the one; why not aim definitely at the other and thus gain complete immunity? In view of their mobility and the consequent feasibility of their transfer when unemployed to decisive areas, the substitution of aircraft for fixed armaments would be a step in this direction. One answer is that the substitution mentioned is but a single, short step, for the savings that would accrue from the abolition of long-range coast defence guns would provide and maintain but few aeroplanes. Many other steps might be required, therefore, before the desired end could be attained. Another answer is that we can never be certain of permanent dominance in either sphere. While suffering a temporary eclipse of our powers, we might, therefore, if without our guns, see naval bases taken from us, and we might see our merchant shipping destroyed in harbour. Warfare is an even more speculative affair now than of old. Not long ago we thought—and in the main rightly—that we could estimate chances by battalions, batteries, battleships and railways, but such estimates may now be vitiated, less perhaps by the genius of leadership than by the appearance of some wonderful new weapon: a tank, submarine, or aeroplane, endowed with peculiar properties, which may have profound effects before the antidote is found. While aiming, therefore, at constant progress and the utilization of the benefits of science, we must hold tight to security and make all our advances from that solid base.

A third answer lies in the difficulty of definition—in degree, compass and range—of such terms as "command" and "dominance," and in the possibility of different interpretations being placed on them by the parties concerned. One belligerent might be satisfied with a slight command, another with a surface command, a third with a local command on which to base his enterprises. Yet a further might think any form of command unnecessary: and if no fixed defences existed he might find he was right.

We could, therefore, never be sure of the necessary dominance in the air and on the sea that would render any attack abortive. Nor, even if we had obtained it, could we be certain of placing an interdict

on the ventures of an enterprising enemy. And the doubt that would prevail as to the safety of our harbours might impose an intolerable drag on the operations of both Navy and Air Force.

Then there is finance to be considered. Owing, however, to lack of relevant information, it can only be treated here in nebulous fashion. But even if the most accurate data were available and in the hands of experts, it would still be no simple matter to pass a definite judgment, owing to the intricate side issues, tactical and strategic, involved, and because it is not only a case of the relative cost of the two weapons, but also of the establishments and buildings required for their creation and maintenance. Certainly, however, whatever evidence there is seems to indicate the gun to be the cheaper weapon. It is more effective for the immediate purpose in view; more durable; less likely to be hit; less exposed to damage and destruction; subject to fewer fashion changes; and, therefore, fewer guns than aeroplanes are likely to be needed. It must be borne in mind, too, that when the political atmosphere is peaceful, guns can be placed on a "care and maintenance" basis with a minima employment of personnel, whereas aircraft must always be in use; and for one aeroplane in the air there may be thirty men on the ground working to keep it there. It would, moreover, be necessary, however many aeroplanes were present, to maintain quick-firing armaments and searchlights against light surface craft and submarines whose attack would be difficult to repel from the air. On the whole, therefore, it seems reasonable to suppose that the provision of sufficient planes to give a security approximately equivalent to that of the fixed armament they would replace would entail considerable additional expense. The one strong argument in support of the claim that aircraft would be economical, as compared with guns, is that, when an alteration in the political situation entails a re-shaping of coast defence policy, the cost of the change would be infinitesimal with aircraft, whereas with fixed armaments it would be a serious matter. But the argument lacks force so long as the aeroplane is ineffective in defence.

From the points of view of technique, finance, tactics, and even to a certain extent of strategy, it would appear, therefore, unsound to replace the coast-defence gun by the aeroplane. To remove any other doubts that might arise, however, we may enter those higher regions where policy and strategy merge into one another, and at the same time cast an eye upon the future.

In the history of amphibious warfare, right down to Dardanelles days, ships of the line have continually attacked forts and, in spite of repeated failure, seem inclined to pursue the same course in future, calling smoke and aircraft to their aid. It has, however, been shown that the new processes offer no greater hope of success than the old.

And there are other factors at work not hitherto mentioned. Battleships —the only vessels employed in the direct attack because all others would be too vulnerable—are already huge, expensive and, if comparison be made with former days, relatively few in number. Seldom would the strategic situation justify a nation in risking one of these costly and scarce creations where a disaster might alter the whole balance of naval power. Moreover, if we study our commitments and scan the political horizon we shall search in vain for a Power to whom such a course is not further prohibited, as regards our home ports, either by distance or by relative strength. And these truths will become more evident as Governments succeed in effecting the naval reductions at which they are now aiming.

Bombardments, therefore, if not already an obsolete form of warfare, may become so as soon as the test of war shall have exposed their futility. That being the case, why keep the coast gun? The answer is that, if it were absent, naval attacks might again become popular, since temporary dominance in the air—a condition precedent to any form of attack on a coast fortress—would enable ships to bombard harbours at short range with but little danger to themselves. Were the A.A. guns also removed, the contents of the harbour would be completely at the mercy of the assailants.

As regards the present and immediate future, therefore, our doubts are resolved, and we find there is no case for replacing the gun by the aeroplane for dealing with short range attacks. The obvious benefits, however, that would accrue from the exchange of a static for a mobile weapon where the latter can fulfil all necessary requirements, coupled with the urgent need of increasing our Air Force, demand that this matter shall be continually reviewed in the light of advances in science, remembering always that, whereas improvements in gun armaments take years to materialize, progress in aircraft construction is more rapid.[1]

Repulse of Landings.

It has already been pointed out that, given the premise of air superiority, the assailant might draw profit from his aircraft in reconnaissance, observation of fire and the imposition of delay on enemy reinforcements. The defender, however, may draw an even greater profit from his aircraft. Unless the enemy venture is of a very short range nature, no conceivable degree of air inferiority should prevent him from bombing transports far out at sea, in addition to attacking

[1] For example, the V/1,500 Handley Page bomber was designed, built and flown—all within six months. "Air Annual," 1929.

them close in shore during the operation of landing; and transports are much more easily sunk than warships. Nor should it deter him from reconnaissance; and, therefore, unless the whole undertaking could be executed under cover of darkness or fog, aircraft would certainly discover it and prevent the assailant from obtaining that surprise which is almost an essential to success. As regards observation of fire, on the other hand, the defender is at a disadvantage, for there will ordinarily be but few A.A. guns available at the landing point, and his spotting aircraft will thus be unprotected against their more powerful antagonists. On the whole, however, the employment of aircraft appears to confer rather more benefits on the defender, even should he be the weaker in that arm, than on the aggressor, and will render the operation of an opposed landing more difficult and doubtful than ever. Were the defender to have a superior air force, the attack would certainly fail, even against quite moderate opposition from land forces. In fact, though fixed armaments cannot be satisfactorily replaced by aeroplanes, it would appear to be a sound policy to reduce the strength of any troops specifically allotted to mobile coast defence to admit of a corresponding increase in strength of the air force. At home, this might imply an access to the strength of the Auxiliary Air Squadrons at the expense of the Territorial Army.

IV. THE DEFENCE—LONG-RANGE EXPEDITIONS.

The Importance of Air Bases.

It is a commonplace that fleets and armies lose power, progressively, the further they advance from their base, partly owing to natural exhaustion and partly to the need of protecting their lines of communication. The handicap imposed is to a great extent removed when a fresh base is found and formed, the operations of British armies from India and British cruisers from Singapore being cases in point. With the air arm the same principle not only holds but is sharply accentuated. However great an air superiority a nation may have attained, it cannot hope to maintain it for long with an expeditionary force despatched beyond the range of its land aircraft; for neither aeroplanes on carriers nor seaplanes will be able to deal with an enemy possessed of serious air power and able to operate from a land base. If, however, while the expeditionary force is still in being, new bases can be found for the employment of land-planes, where they can also be protected and supplied, then there is every chance of the maintenance of their original superiority without which the expedition has but small prospect of success.

Distant Protection.

These rather obvious facts are of peculiar interest to the British Empire, and furnish the key to the problem of coast defence in our

Dominions, in India and in some of our more distant maritime bases. Let their implications be sought, for example, in the defence of India. No expedition could reach that country by sea with any large residual air power. Nor is there any point on the Indian coast or in its proximity where it would be possible to establish an air base free from the striking power of the British Army in India. Early news would have been received of the start of the expedition, and aircraft would have concentrated from all parts of the country to oppose it. Transports and aircraft carriers would probably be destroyed as soon as within aircraft range, and continual bombing attacks would be made on the fleet as it approached. The expedition might succeed in reaching Bombay, say, and, in the absence of fixed armaments, might even bombard the town and harbour, causing a certain amount of damage; but it could do no more. Then, having suffered considerable damage from bombs, it would return and probably become a prey to the weaker fleet on the return voyage. The prospects of success of such an expedition would be so hopeless, provided an adequate, though not necessarily large, air force existed in India, that heavy fixed armaments in coast defences would not be needed to repel its incursion. The latter might indeed save a port from bombardment by a raider, but the known existence of an air fleet-in-being in the objective country would act as a complete deterrent from a greater enterprise. The same arguments apply with regard to Australia, and if, as we may, we exclude from consideration the possibility of war with America, also to Canada; and this with added force, because their coast lines are much more susceptible to serious attack than those of India, where hydrographic and climatic conditions are adverse and communications with the interior difficult.

Singapore will be found to react differently to the test. An expeditionary force, though out of air range from its home aerodromes, might easily establish air bases either in the mainland or on islands within the necessary range of Singapore harbour. With fixed armaments the attack on the harbour might be repelled on the lines already discussed; but, in their absence, the defender's aeroplanes would be driven down, ships in harbour could be bombarded and bombed, and the hostile fleet, after a process of minesweeping, could enter the harbour. It might, of course, be possible to send air reinforcements from India, but only at considerable risk, and they might not suffice, given the premise that the enemy had original air superiority.

All naval bases on the eastern, southern and south-western coasts of Great Britain come into the short range category; and it might be a little risky to omit from it even those on the western coast and in Ireland. Obviously, too, Malta and Gibraltar need fixed armaments. A.A. guns, supplemented by balloon nets, would be of particular value

because, although the fleet might be able to retain command of the sea, air superiority would probably be won by an enemy specially favoured by position in that region. In fact, given good anti-aircraft protection, a fleet in the Mediterranean should be safer in harbour than at sea; without such protection harbours would be untenable. Aden must also be defended by guns, for it would be possible for an enemy, were the Arabs among his allies, to establish aerodromes within easy reach; and it is a fortress that might become of vast importance to us as a guard to the European flank of our Cape route, should we have temporarily lost the command of the Mediterranean. Bermuda comes into the same category, but for a different reason: namely, that owing to its isolated position, it would be more than ordinarily wasteful of mobile power to keep aircraft there.

In fact, in making a world-wide application of the test, we find that coast protection can be safely entrusted to aircraft only in India and the Dominions; and even there light, fixed armaments with searchlights should be emplaced for repelling raids on the principal harbours. Fortunately, in these continental areas, the development of air transport will be rapid, and the necessary increase in aircraft can, therefore, be made partly on a civilian basis. Incidentally, too, should our eastern traffic be forced to move by the Cape in war, and should no previous arrangements have been made to furnish harbours with adequate defences along that route, it would, given a sufficiency of aircraft, be both feasible and advisable to afford coast protection to it, temporarily, from the Air Force. Again, in the great hinterland of Africa there is the probability of aerial development which might prove of value in the quick change over of bases.

V. COMMAND.

Into this rather intricate problem, the question of command must enter. It is important to ensure in the first place that no doubt shall arise as to who is the commander and, in the second place, that the direction shall be in the hands of the predominant partner.

Where defence is mainly a matter of fixed armaments, the difficulty as to command does not arise, because such aeroplanes as may be available will be used for reconnaissance and spotting either for naval or for military forces. Nor does it arise in the absence of guns; for the Air Force is naturally then supreme. But where in addition to fixed armaments there is an independent air force, as, for example, there might be at Singapore, Hong Kong or Aden, the matter needs careful consideration. The fixed armaments have been emplaced because the harbour is of strategic importance. If the independent air force is present for the same reason, the relative strength of the respective

forces might decide the issue. On the other hand, if the independent air force is there for a subsidiary purpose, such as the control of neighbouring tribes, then the fortress commander should be a soldier.

In the Dominions the matter is simple. The primary domestic business there is coast defence; and it might well be entrusted to an air commander: wholly in peace, and, in war, until such time as the enemy might begin an actual attempt at landing, when control would pass to the army commander on the spot. In India, the affair would be more complicated, and the question of command would need close definition. Probably, the whole air force would be placed in war under the Commander-in-Chief with delegation of responsibility to the Air Officer Commanding for distribution of units in accordance with the general plan of the former. The Navy, too, must have a say in the matter for the safety of its bases depends on the solution of the problem. Naval activities in this connection should, therefore, be combined as far as possible with that of the Air Force. Fortunately, nowadays, common problems of this nature are thrashed out in peace by the Heads of the fighting Services sitting in conclave. They would certainly cause endless discord if tackled for the first time in war.

VI. CONCLUSION.

Our conclusions may now be summarized. The primary object of the Navy is to gain and keep the command of the seas. That of the Air Force is to win and maintain superiority in the air. If they fail in these objects, the two Services will not be able to play their full part towards the security of our trade and the preservation of the Empire. To achieve these aims freedom of strategic action is essential; and such freedom is denied where each has to consider the protection of bases The existing system definitely commits coast defence to the care of the Army, in whose element it lies and to whose low order of mobility and natural defensive capacity it is well suited. It has stood the test of time throughout a long series of naval operations and in the Great War. Any big change in it should, therefore, be made only when the operation of some new weapon of war makes the need clear and insistent. It has been shown that aircraft do not have this effect at the moment. The superiority of fixed armaments in relation to ships remains, largely by virtue of aid from the air, much where it stood. Aircraft, too, have a far lower defensive power than coast guns. To attempt, therefore, to replace the latter by the former without any reduction of power would entail vast expense.

There are, however, certain tasks for the Air Force in coast defence, apart from spotting for artillery, and apart also from that distinct, though imponderable, protective influence due to its mobility that are

implicit in its very existence. It has definitely reduced the probabilities of attack by its capacity for reconnaissance which, combined with the speed and certainty of wireless communication, has greatly enhanced the power of the defender to bring his mobile instruments, whether they be men, aircraft, submarines or guns, to the danger point in time to meet the threat. If in superior force, it will definitely prevent the success of any hostile enterprise against our shores, however powerful an armada the enemy may produce. Then, unless considerably inferior in force, it can make enemy attempts at landing practically impossible. Finally, in certain distant regions, such as India and the Dominions, it might with advantage replace all heavy coastal armaments, and in war it might furnish temporarily the principal defence of any new maritime bases. It will be seen that these duties will not interfere with the primary task of gaining air superiority, except that it may not often be possible to draw reinforcements from the distant countries employing aircraft for coast defence.

Co-operation is now as ever the secret of success, and it should find its best expression in the subject under discussion, in allowing the static elements to act defensively within their narrow compass, thus releasing the mobile elements to operate freely over wide ranges in accordance with the needs of the strategic situation.

THE ESSENCE OF WAR

By Captain B. H. Liddell Hart.

A SERIES of articles have recently appeared in the Journal dealing with the Principles of War; but what seems to be far more important than abstract principles are practical guides. Napoleon knew that only the practical is useful when he gave us his maxims. Yet the modern tendency has been to search for a "principle" which can be expressed in a single word—and then needs several thousand words to explain it. Even so, these "principles" are so abstract that they mean different things to different men, and, for any value, depend on the individual's own understanding of war. The longer the search for such omnipotent abstractions is continued the more do they seem a mirage, neither obtainable nor useful, save as an intellectual exercise.

In contrast, certain axioms seem to emerge from a close and extensive study of war. These cannot be expressed in a single word, but they can be put in the fewest words necessary to be practical. They apply both to strategy and tactics, unless otherwise indicated.

What to Aim for in War.

1. *Always try to choose the line (or course) of least probable expectation* —from the enemy's point of view.

2. *Follow the line of least resistance*—so long as it can lead you to any objective which would contribute to your underlying object. (In tactics this axiom applies especially to the use of your reserves. In strategy it applies to the exploitation of any tactical success).

3. Aim to make these two lines coincide by taking a line of advance which threatens *alternative objectives*. Thus you will have your opponent on the horns of a dilemma, and have the opportunity of swerving to gain whichever objective he guards least. (This axiom applies mainly to strategy, but should be applied where possible in tactics).

4. Ensure that both your plan and your dispositions (or formation) are *elastic*. Your plan should foresee and provide for a next step in case of success, or failure, or of partial success—which is the most common case in war. Your dispositions should be such as to allow this exploitation or alternation in the shortest possible time.

What to Avoid in War.

5. *Don't lunge when your opponent can parry.* A general has more resources, and should have more resource, than a bayonet-fighter. And in contrast, a body of troops has not the same power of quick recovery as an individual.

The experience of history shows that no effective stroke is possible until the enemy's power of resistance or evasion is paralysed. Hence no commander should launch a real attack upon an enemy in position until he is satisfied that such paralysis has developed. (Although worded tactically, this axiom should also be construed strategically).

6. *Never renew an effort along the same line (or in the same form) after it has once failed.* A mere reinforcement of weight is not sufficient change, for it is probable that the opponent also will have strengthened himself in the interval.

* * * * *

The critic may well advance the usual objection to the first axiom, "What will the enemy be doing meantime?" The historical answer is that he will be doing the obvious and assuming that you are doing likewise. The experience revealed in history is sufficiently abundant to justify this hypothesis. Each side tries to frame the plan which seems most sound: it credits its adversary with similar soundness; and the result is stalemate. Then they attempt further moves on similar calculations—until at last exhaustion or despondency calls "time" to the struggle.

Very infrequently a commander has rejected the obvious and pursued the unexpected. He has won a decisive success—unless fortune has played foul. For luck can never be divorced from war, as war is part of life. Hence the unexpected cannot guarantee success. But it guarantees the best chance of it. That is why the successes of history, if not won by abnormally clever generalship, have been won by generalship that is outrageously foolish. Perhaps that is why Britain has had such a long run on the world's stage.

"ECONOMY OF FORCES"

A PLEA FOR THE OLDER MEANING

By "PHORMIO."

EVER since 1920, when official sanction was first given to certain broad ideas under the title of "The Principles of War," there must have been many officers in all three Services who have felt a certain uneasiness about the eventual result of this course of action. Apart from doubts as to whether any human brain is capable of a formulation of the principles of war, which shall be both comprehensive and of practical value, it must have occurred to many that these principles can only be fully absorbed either by means of profound study, or perhaps, unconsciously, through an extensive experience of warfare. To suggest that the principles of war can be enunciated in half-a-dozen words or phrases, each followed by a few facile sentences of explanation, is to give the matter the appearance of being unduly easy, with the possible result that further criticism of an enquiry into this most important and interesting subject will be discouraged. There is also a danger that too much importance may come to be attached to a mere form of words.

Fortunately, there are signs that the former danger is less than might have been expected. Recent articles in the R.U.S.I. JOURNAL have shown a growing reluctance to submit to a fixed set of principles, and it is to be hoped that the outcome will be a more flexible conception of the subject, and a renewed vitality, without which mere principles very soon become bare bones.

So far, however, little has been said of the second danger mentioned: the confusion which may arise from the use of a fixed form of words, when words can and do change their commonly accepted meanings. An interesting example of this is the case of the expression, Economy of Forces.

The exact origin of this phrase is not known. It seems that it first appeared during the wars of the French Revolution, and Foch attributes to Carnot the resuscitation of the idea which it was intended to convey.[1] However that may be, it is clear that this expression had a definite meaning for Clausewitz, writing soon after the close of the Napoleonic wars. It is also at once clear that the word "economy" was used

[1] "The Principles of War" (English edition), p. 53.

in its original sense, " the orderly arrangement and management of affairs," a sense which has now almost ceased to be current in English.

To Clausewitz the idea conveyed was " the principle of watching continually over the co-operation of all forces, or, in other words, of keeping constantly in view that no part of them shall ever be idle. Whoever has forces where the enemy does not give them sufficient employment . . . . he is a bad manager of his forces." He also says " unmistakably this idea is bound up with the principles contained in the last three chapters,[1] it is the same truth, but seen from a somewhat more comprehensive point of view, and condensed into a single conception."[2]

To Foch, writing three-quarters of a century later, the same general idea is conveyed. To him it meant " the art of pouring out all one's resources at a given moment on one spot ; of making use there of all troops, and, to make such a thing possible, of making those troops permanently communicate with each other instead of dividing them and attaching to each some fixed and invariable function ; its second part, a result having been obtained, is the art of again so disposing the troops as to converge on, and act against, a new single object.[3]

What has occurred since ? The expression, Economy of Forces, is evidently one of sufficient importance to justify its use in any treatise on the art of war ; but, unfortunately, the meaning of the word " economy " has undergone a change. To the great majority of minds its old meaning survives only in the word " economics," and " economy " has come to be almost synonymous with "saving."

This meaning of " economy " may have gained much strength from the fact that in presenting the Annual Service Estimates to Parliament so much stress is laid on the actual numbers of the personnel that are sanctioned in any one year. Economy has almost become synonymous with a *reduction* of personnel.

Again, in the small wars of the Victorian era, Economy of Forces became synonymous with a cutting down of the number of troops employed in these campaigns, and with " economising " man power by avoiding casualties.

It appears, therefore, that the old expression has been given a modernised meaning. To make the change of meaning more complete, even the dominant word has been slightly altered, and " forces " has become " force." What do we now find ? what was to Foch " this

[1] " Assembly of Forces in Space " ; " Assembly of Forces in Time " ; and " Strategic Reserve."

[2] " On War " ; Book III, Chapter XIV.

[3] " The Principles of War " (English edition), p. 51.

superior principle," and to Clausewitz " the principle contained in . . . three chapters . . . condensed into a single conception," has now become " To economize [i.e., to save] strength . . . must be the constant aim of every commander."[1]

One cannot but pause for a moment and compare this new definition with the teachings of Foch in order to appreciate in full the extent of the change:

" . . . the art of pouring out all one's resources "—Foch.
" To economize strength . . . "—F.S.R., Vol. II.

What can be done to reconcile this divergence of meaning? Supposing, for the moment, that the idea at present officially conveyed by Economy of Force is sound, it is true that by combining it with those of Concentration, Co-operation and Security, we can arrive at a conception akin to that formerly conveyed by Economy of Forces. But should the matter be left like this; surely it was the unity of conception which gave the old idea of Economy of Forces its value; the idea that forces should be so distributed that every ounce will pull its weight; that the distribution should be kept sufficiently fluid to meet varying situations; that all available forces must be expended in the most profitable manner.

That this idea is important on land is shown by the prominence given to it by Foch in his teaching at the Ecole de Guerre. Let us see how it applies to sea warfare. Its effect on tactics is perhaps most clearly displayed by citing an example in which it was very definitely neglected. Before joining action with the French fleet off Minorca, Byng actually ordered a ship out of his line in order to equalize its numbers with those of the enemy. This he was tacitly authorized to do by Article I of the Additional Fighting instructions, which allowed for surplus ships being fallen out of the line of battle to act as a reserve, succouring the line as their captains judged best. No doubt the idea seemed quite reasonable to the authorities of that time, particularly as on land ignorance of the enemy's dispositions and the physical impossibility of bringing all troops into action simultaneously made the employment of a tactical reserve a very usual procedure. But in sea fighting, with no such limitations, to employ ships in this manner was radically unsound: it was the antithesis of economy of forces.

The other side of the picture is best shown in that most remarkable document, Nelson's " Trafalgar Memorandum " of 9th October, 1805. Redolent as it is of every true principle of naval tactics, its clear exposition of containing the van while bringing a heavy concentration

[1] Field Service Regulations, Vol. II (1929), p. 8.

on the enemy's rear is a good example of the working of economy of forces. Not only did every ship exert every ounce of her strength, but that strength was so disposed as to have the maximum possible effect.

In the realm of strategy the action of this principle is possibly of even greater importance. The distribution of our forces so that all real needs are attended to, but none too much; the avoidance of unnecessarily heavy defensive concentrations; the need for flexibility in our dispositions; the correct solution of what has been described as "the continual conflict between cohesion and reach."[1]

All these are most clearly displayed in what is usually known as the Trafalgar campaign: a campaign in which almost every move on the British side was ordered with an unerring touch, founded on true principles, not learnt from books but absorbed in the hard school of prolonged naval warfare. The movements of our fleets and squadrons during those critical weeks of the summer of 1805, culminating in Cornwallis's refusal to be forced into a passive concentration, and his consequent division of the fleet on the 16th August, are perhaps as fine an example of the workings of the principle of Economy of Forces as could be wished for.

But it is not only in operations that the idea conveyed by this principle is of benefit. In the composition of navies and fleets, and even in the design of ships, it should never be lost sight of. It is the great antidote to one of the worst by-products of material improvement: over-specialization. How often has one heard it said that, given certain circumstances, such and such a freak type of ship would be very valuable; therefore, why not build some? Or that if such and such a feature were incorporated in the design of a ship it might be very useful indeed. The principle of Economy of Forces shows us at once that the question is not what *might* be useful in certain circumstances, but whether, when viewing the fleet or the ship as a whole, and considering *all* the duties required of it, we are getting the maximum value for the money and man power expended. The Navy must be so constituted that, so far as the circumstances of naval warfare render this possible, every component part is pulling its weight continuously throughout a war. The fleet must be so composed and the ship so constructed that every unit and every part is employed to the utmost effect on the day of battle.

[1] Corbett: "Some Principles of Maritime Strategy," Part II, Chapter III. "Concentration and Dispersal of Force." Almost the whole of this chapter, and in many cases even the sense in which the word "concentration" is used, could equally well have come under the heading of "economy of forces." But Corbett appears never to have used this phrase, possibly because he considered it unsuitable or misleading to an English audience.

One supposes that this idea is of equal value when dealing with the problems which confront the Air Force: in deciding on the correct distribution and best proportion of "fighters" to "bombers," for example; or in determining to what extent specialization of machines is necessary. In fact, there would seem to be no case in which this principle of ensuring that every part is pulling its weight to the last ounce is not of great value.

It is hoped that enough has been said to indicate the usefulness and wide application of the principle of Economy of Forces, as conceived by those by whom it was first formulated. It is applicable to all forms of warfare and even to preparation for war. To scrap such an idea would seem to be both wasteful and unsound. To retain its name, and to attach to that name a new idea must inevitably lead to confusion in the minds of those who study the writings of the past, as well as the text books of the present, for guidance in the art of war. But to retain the original idea and use words, which for most people have changed their meaning, to describe it, is equally confusing. An expressive phrase, sometimes used in the Navy, is "a well balanced ship." Would it not be possible to retain the idea propounded by Clausewitz and speak of it as the "well balanced distribution of forces?" Though clumsy, such an expression would at all events be free from the danger of misconception.

What is to become of the idea conveyed by the present Economy of Force of the Field Service Regulations? Is it really necessary to give this idea its present position of importance? Whatever meaning it may be possible to read into the official definition, there is little doubt that to the majority of officers to-day "to economize" means merely "to save." To save force in one place in order to expend it in another *may* be sound, but is there not a danger of suggesting mere saving for savings sake?

War is a resort to force; its essence is the *expenditure* and not the saving of force.

THE SIMON REPORT

RECOMMENDATIONS CONCERNING DEFENCE

A STATUTORY Commission was appointed by Royal Warrant on the 26th November, 1927, to inquire into " the working of the system of government, the growth of education, and the development of representative institutions in British India, and matters connected therewith " ; also to report " as to whether and to what extent it is desirable to establish the principle of responsible government, or to extend, modify, or restrict the degree of responsible government then existing therein, including the question whether the establishment of second chambers of the local legislatures is or is not desirable."

The Chairman of the Commission was the Right Hon. Sir John Simon, K.C.V.O., P.C., O.B.E., M.P. ; the other Members were Viscount Burnham, G.C.M.G., C.H., T.D., Lord Strathcona, the Hon. Edward C. G. Cadogan, C.B., The Right Hon. Vernon Hartshorn, P.C., O.B.E., M.P., Colonel the Right Hon. G. R. Lane Fox, P.C., T.D., and Major C. R. Attlee, M.P.

In June, 1930, this Commission rendered a unanimous report. Volume I (Cmd. 3,568, price 3s. od.), appeared first. It contains a very comprehensive survey of British India, including a review of the military problem. The importance of realising the facts of this problem is specially stressed.

Volume II (Cmd. 3,569, price 3s. od.), followed shortly afterwards. It presents the Commission's Recommendations. The Report concludes with the hope that " it may furnish materials and suggest a plan by means of which Indian constitutional reconstruction may be peacefully and surely promoted."

Part V of Volume II is devoted to " The Constitutional Problem in Relation to the Defence of India." The following is a summary of the most important points made by the Commission in this connexion.

The Commissioners are emphatic as to the supreme importance of the defence of India, both to India and to the Empire as a whole. The land frontier of India exposes her in the North-West to a constant and pressing danger of a magnitude which is quite without parallel in any

other part of the Empire. The danger from the North-East is not comparable in any measure with that which threatens India from the North-West ; but in view of their proposals for the separation of Burma from India, the Commissioners consider that, whatever arrangements are made for the defence of the North-East, they must be co-ordinated between India and Burma. There is no doubt in their minds that, at least for a very long time to come, it will be impossible for the Army in India to dispense with a very considerable British element, including in that term British troops of all arms, a considerable proportion of the regimental officers of the Indian Army and the British personnel in the higher command. While they consider steady progress should continue in the direction of an ultimate policy of building up an entirely Indian force, they state that the issues involved are too vital, and the practical difficulties too great, to justify a precipitate embarkation on a wholesale process of substituting Indian for British personnel in the Indian Army. They regard it as beyond question that Parliament cannot wash its hands of all responsibility for the Indian Army, nor do they see how, in that event, British officers and men could be recruited and called on to serve in India.

The Commissioners' ultimate recommendations are made with the object of reconciling (*i.*) the introduction of an increasing measure of responsibility in the central government, with (*ii.*) the impossibility of relinquishing control over an army containing a British element to ministers responsible to any elected legislature. They point out that such a transfer can only take place when no part of the Army in India consists of British officers or troops recruited by the Imperial Government, a process which must occupy very many years. Further, it will not be possible to develop the policy of Indianization to a point which will bring a completely Indianized army within sight, until the slender trickle of suitable Indian recruits for the officer class flows in much greater volume, until sufficient Indians have attained the experience and training requisite to provide all the officers for, at any rate some Indian regiments, until such units have stood the only test which can possibly determine their efficiency, and until Indian officers have qualified by a successful army career for high command. Even then years must elapse before the process could approach completion.

The needs of internal security and the obligations to Indian Princes present distinct difficulties if the army were subject to Legislatures not under the control of the Imperial Government. It is impossible to contemplate the use of British troops, who are the neutral guardians of a peace frequently assailed by bitter communal feuds, to quell civil disturbances at the unrestricted bidding of ministers popularly elected and answerable to popularly elected legislatures. Nor, in the case of

the Indian Princes, can the Crown, upon whom the States rely for the fulfilment of its obligations, lose control of the instrument by the use of which in case of need those obligations could be discharged. The principle involved, which has been clearly laid down and observed in many parts of the Empire, is that troops recruited under the Imperial authority ought not to be used in support of a policy for which the Imperial Government is not ultimately responsible.

Two propositions emerge from this reasoning: first, control of an Army including a British element cannot be made over to an Indian Legislature; secondly, so far as it is possible to forecast the future, the evolution of an entirely Indian military force, capable of undertaking unaided the tasks now discharged by the Army in India, must be a very slow process indeed. But despite the essential difficulty of reconciling these propositions with increased self-government the Commissioners are not deterred from making their contribution towards a constructive plan for dealing with it.

From a brief survey of the burden of military expenditure falling upon India, the Commissioners ask the question—what is the Army in India really for? They reply—that they are satisfied that the objects for which the Army in India exists are the defence of India against external aggression and the maintenance of internal order. And they are at some pains to dispose of the plea is not only that the size of the Army fixed by the War Office, but that there is kept in India, at the expense of the Indian tax-payer, a reserve not needed in India. On the contrary, its size is fixed on the advice of the Commander-in-Chief in India and of the Government of India. Constitutionally the ultimately responsible authority is the Secretary of State. In some matters of great importance the Cabinet, often perhaps seeking the advice of the Committee of Imperial Defence, incurs the ultimate responsibility of making a decision. In the Cabinet, the Secretary of State shares in the joint responsibility for a decision, but with the important distinction that, if Indian revenues are involved, no acquiescence on the part of the Secretary of State can be effected without the concurrence of the majority of the Council of India. The argument that because India has occasionally been able to lend troops for service abroad the strength in India is in excess of India's needs, is easily proved fallacious, and the Commissioners were satisfied that its strength is not more than is calculated to be necessary for meeting emergencies of internal disorder and the possibilities of external attack. The real question is not whether the size and expense of the Army serving in India is greater than is needed for the twin purposes of internal order and frontier defence, but whether in connection with the latter of these purposes there is an Imperial, as opposed to a purely Indian, aspect which might make it inequitable to regard

the cost as falling solely on Indian revenues. Thus, if the defence of India were to fail, it is not only India that would suffer, the whole Empire would be involved. The North-West frontier is an international frontier of the first importance, from the military point of view, to the whole Empire, and the effective defence of India is a matter in which other parts of the Empire are also closely and directly interested. They, therefore, come to the conclusion that India and Britain are so related that Indian defence cannot, either now or in the future which is in sight, be regarded as a matter of purely Indian concern. The control and direction of such an Army must rest in the hands of agents of the Imperial Government. In order that this condition should not be a bar to the realisation of responsible government in British India they propose that the Army in India should no longer be under the control of the Government of India, but under the Imperial agency of the Viceroy, acting in concert with the Commander-in-Chief. They suggest that an equitable adjustment of the burden of finance might take the form of an agreement to provide from Indian revenues an annual total sum, subject to revision at intervals, and with the opportunity of sharing in economies. The contribution would be non-votable. In the case of frontier tribal wars the charges should, they think, fall entirely on Indian revenues; while in the case of exceptional expenditure rendered necessary by the organized attack of a foreign power the financial burden might be spread more widely.

The foregoing proposal would require certain administrative adjustments. If the responsibility for the Army in India is to rest with the Imperial Government, that Government would continue to be represented in India by the Governor-General; and the day-by-day administration of the Army would be, as now, in the hands of the Commander-in-Chief. But the Commander-in-Chief in practice is a Member of the Governor-General's Council. So long as the Commander-in-Chief is a member of the Executive Council he is necessarily a member of one or other Chamber of the Indian Legislature. The Commissioners consider, therefore, that he should not be a Member of the Executive Council and should not sit in the Legislature. His immensely important and onerous duties are better discharged outside it. And in Part IV, ch. 2, para. 170, the Commissioners further consider that even if their proposal to withdraw the control of the Army from an elected legislature is not agreed to, the Commander-in-Chief should be outside the Governor-General's Council and should not be called on to take part in the debates of the Legislature. He would retain the rank and precedence at present belonging to him, and would, of course, be called into consultation on all necessary occasions. Questions of defence, so far as they come before the Indian Legislature, should be dealt with

by a civilian. The Secretary to the Government of India in the Army Department would be available, but on occasions of the first importance the task would appropriately fall upon the new Member of the Viceroy's Executive Council, advocated by the Commissioners in para. 171, whom they describe as the Leader of the Federal Assembly. The Commander-in-Chief would therefore cease to be the holder of a portfolio in the Government of India. The Central Legislature, as now, would not vote supply for the Army; appropriations of revenue for this purpose would be authorised by certificate of the Governor-General. The Commissioners add that they would like to see the constitution of some Committee on Army affairs on which the Central Legislature—and in time, they hope, the Indian States also—would have representatives for the purpose of discussing, and keeping in touch with, military questions.

Having thus sketched in bare outline the main features of their method of treatment of the problem they explain its consequences on the future Indianization of the Army, and on the separation of Burma from India. Keeping before them their view that we are pledged to go forward steadfastly and sympathetically with the Indianization of the Army, subject only to the over-riding requirements of military efficiency, they feel that their proposal opens the question whether that Government, in co-operation with the Central Legislature, might encourage the organization, training and equipment of certain military, and it may be naval, forces of its own, independently paid for and controlled, which would contain no British element. As regards the co-ordination of defence between India and Burma, they feel it would be facilitated if the defence of the North-East, as well as of the North-West, Frontier became an Imperial function.

Among their recommendations for the future government of India the Commissioners had advocated the transfer of law and order to elected ministers in their Provinces. The existing Army cannot, as they have pointed out, be under the orders of ministers. Yet the preservation of law and order may depend in the last resort on the use of the Army. But even if the preservation of law and order be transferred, the British Parliament's ultimate responsibility for the maintenance of the public peace continues unimpaired. It follows, therefore, that Provincial Governments have a right to look to the British Government for military force to enable them to discharge their obligations. The Commissioners consider the difficulty can be met by requiring every demand for Imperial troops to be put forward by the express authority of the Governor of the Province himself. The excessive use of military forces as a substitute for police should be guarded against by requiring a financial adjustment between provincial and central revenues.

In conclusion, they refer to the hope that the constitutional evolution of India will lead to the establishment of a federal system in which Indian States as well as British India will find a place. They point out that, at present, the Army in India is paid for entirely out of the revenues of British India, though there fall into the fund contributions from many Indian States. At present, too, some States have forces of their own, portions of which are organized for service in case of need alongside the Army for which the Commander-in-Chief is responsible. They cannot believe that the movement towards a greater federal unity will not in time lead to changes in this situation. They ask whether it is not desirable to place the Army in India upon its proper footing now as the best means of promoting the federal idea. By this means a road might be opened by which the Indian States can participate naturally and easily, on equal terms with British India, in one of the functions of a federated India which cannot be regarded as the exclusive interest of a part of the whole.

DEVELOPMENTS IN ARMY ORGANIZATION

By LIEUTENANT-COLONEL THE HON. P. G. SCARLETT, M.C., *p.s.c.*

On Wednesday, 26th February, 1930, at 3 p.m.

MAJOR-GENERAL C. BONHAM-CARTER, C.B., C.M.G., D.S.O., in the Chair.

THE CHAIRMAN introduced the Lecturer.

LECTURE.

BEFORE discussing recent developments in Army Organization, it is advisable to refer to the difficulties of the task of organization peculiar to the British Army, and to the reasons which have necessitated the changes that are taking place. Moreover, we have to remember that the present organization is still emerging from the chrysalis stage, and that it still has to go through various stages of experiment and transformation before developing into a more or less perfected fighting machine.

Further, the Great War, fought as it was in many different theatres and under varying conditions of ground and climate, has yielded a mass of material facts to consider. In addition, modern scientific developments, especially as regards the development of the internal combustion engine, radio-telephony, automatic weapons, and aviation, have necessitated a departure from old ideas and the introduction into the Army of modern machinery. Conditions and military principles have not changed, but methods of fighting and tactics must be modified to conform with new weapons and equipment. Finally, different theatres of war require different methods and different equipment, so that, in view of our wide and diverse responsibilities, our organization must be far more elastic than that of nations which are faced with definite problems.

I now propose to offer some remarks concerning those changes which have actually been introduced, and I will attempt to explain the new administrative problems with which we are faced and how we propose to deal with them.

I. The British Army in Peace.

The normal functions of our Army in peace time are in the nature of garrison and police duties. Units overseas must be able to move anywhere at short notice and take the field without further reinforcements.

The chief duties of home units are: first, to provide trained drafts for units overseas in order to keep them up to strength and to relieve them periodically under the Cardwell system; secondly, home units, completed with reserves, form the first reinforcements of overseas garrisons; thirdly, they form the cadre of our small expeditionary force, which may be required to take the field and maintain itself whilst the Territorial Army is being placed on a war footing. At the same time, these units will have to find the training cadres needed to prepare post-war recruits required for expansion and wastage in the field. Consequently, the strength of the Regular Army is determined by the numbers necessary to protect our overseas possessions and mandated territories, and bears no relation to any possible commitment we may be called upon to undertake under our existing obligations.

The Regular Army also performs the functions of an experimental force. New ideas and organizations are tested by Regular units, and it is not until we are satisfied with the results that they are introduced into the Territorial Army. Since the Regular forces form the advanced guard to the Territorial Army, on which our expansion for war depends, it is obvious that, however efficient the Territorial Army may be, a small, well-equipped and highly-trained professional army is an absolute necessity. The smaller the army the more efficient it must be, and the harder it is to devise an organization sufficiently elastic to provide our peace requirements economically, and at the same time maintain a nucleus on which the military machine can expand in war.

II. The Results of Mechanization.

The greatest changes that have lately taken place are due to mechanization. Mechanization can be divided into two categories:—

(*a*) The replacement of horse-drawn vehicles by motor vehicles;

(*b*) The introduction of armoured fighting vehicles.

In the first instance, mechanization was forced upon us by the world shortage of horses and the substitution of the motor for the horse in commerce. The whole of our transport is now mechanized, except the first line of certain units. This is remaining horsed for the present, except where a definite advantage can be shown by mechanization. Our second and third line transport echelons now consist of 3 ton and 30 cwt. four and six-wheeled lorries, the six-wheelers having a cross-country capacity.

In peace, for reasons of economy, we maintain only sufficient vehicles for our immediate needs, and a small workshop cadre on which our war organization can expand. Vehicles suitable for military transport purposes are increasing in civil life, and therefore, although on mobilization we may hope to obtain, off the street, the numbers we require, in the first instance the problem of repair and maintenance, due to lack of standardization, will present considerable difficulties.

The introduction of the motor, with its increased mobility, will not obviate the necessity for good railway communications, although it will allow a more elastic organization of the supply services, and will enable troops to operate at greater distances from railhead.

The armoured fighting vehicle presents a different problem as it has no counterpart in civil life. The track vehicle is still in its infancy and has not had the advantages of time, money and long experience spent on it compared with other types. The Army is responsible for its design, production and experiment, and considerable progress is being made. I do not propose to go into any technical details; I will refer those who are interested in such details to a lecture given by the Director of Mechanization and published in the "Journal of the Royal Artillery" for July, 1929.

The armoured fighting vehicle, in the form of medium and light tanks, armoured cars and carriers, now forms an integral part of the Army. It is too early to say exactly how these will be organized in the future, but there are already in existence tank battalions, armoured car cavalry regiments and armoured car companies. In addition to the armoured fighting vehicle, properly speaking, we have the artillery tractor and gun on self-propelled mountings, as well as the small two-seater car, used for reconnaissance and inter-communication purposes.

The speed and circuit of action of these vehicles introduces new problems into warfare, which require careful study in all their tactical and administrative aspects.

Another object in mechanization is economy in man power wherever possible by the introduction of those power tools designed for hauling, lifting and drilling, which may be found applicable to military purposes.

III. Maintenance of Mechanical Transport (M.T.) Vehicles.

The Master-General of the Ordnance (M.G.O.) is now responsible for the design of all vehicles, and, through the hands of the Ordnance, he is responsible for the repair and maintenance of all vehicles other than those driven by Royal Army Service Corps (R.A.S.C.) drivers. The Quartermaster-General (Q.M.G.) is responsible for the subsidy of civilian motor vehicles suitable for transport purposes and the main-

tenance and repair of all R.A.S.C. vehicles. Under present arrangements it is proposed to hold 25 per cent. of M.T. vehicles spare in a theatre of war. In the R.A.S.C. 10 per cent. are held spare in units and the remaining 15 per cent. at the vehicle reception depot at the base, which has an offshoot at the advanced base. In the case of vehicles for which the Royal Army Ordnance Corps (R.A.O.C.) are responsible, such as armoured fighting vehicles, artillery tractors and carriers, no spare vehicles are held with units, and they are divided as considered necessary between the advanced base and base ordnance depots and the field parks. Included in each R.A.S.C. unit there is a small workshop. Repairs to R.A.S.C. vehicles that cannot be carried out by the units are dealt with either at the M.T. vehicle reception depot or the M.T. heavy repair shop at the base. The base M.T. store depot is run as a separate unit. The vehicles for which the R.A.O.C. are responsible are repaired in workshops allotted to formations, behind which are the base and advanced base ordnance depots and workshops, which combine the duties of holding spare vehicles, stores and repair shops.

Mechanized units include in their establishment a small number of artificers equipped with hand tools for minor repairs and replacements not requiring machine tools, but, as experience is gained, the drivers and fighting personnel will be trained to carry out most of the unskilled work. Behind the units we have the R.A.O.C. mobile workshops, consisting of headquarters and a number of sections corresponding to the strength of the motor vehicles in the formation. Unit sections can be transferred and attached to the formation concerned, or can accompany the unit when detached from its parent formation. Normally, the division is the smallest formation that justifies the provision of a complete workshop. Small sub-sections equipped for minor recoveries are provided to work between formation workshops and mechanized units. Mobile workshops cannot generally function when movement is taking place, but they are able to send forward assistance in the shape of artificers and spare parts when required.

After fixed workshops have been established, R.A.O.C. mobile workshops deal with repairs to armament, M.T. and horsed transport vehicles, range-finding and optical instruments, while work which cannot be undertaken by them is sent to the base or advanced base. Small arms and signal equipment which cannot be repaired in the unit will normally be replaced from the base or advanced base. A section of the field park, which is a corps unit, can be detached to serve a mechanized force operating on its own. (*See* diagram A).

IV. Staff.

In the Great War there were in the field three principal staff officers,

DIAGRA

NORMAL SYSTEM OF SUPPLY OF

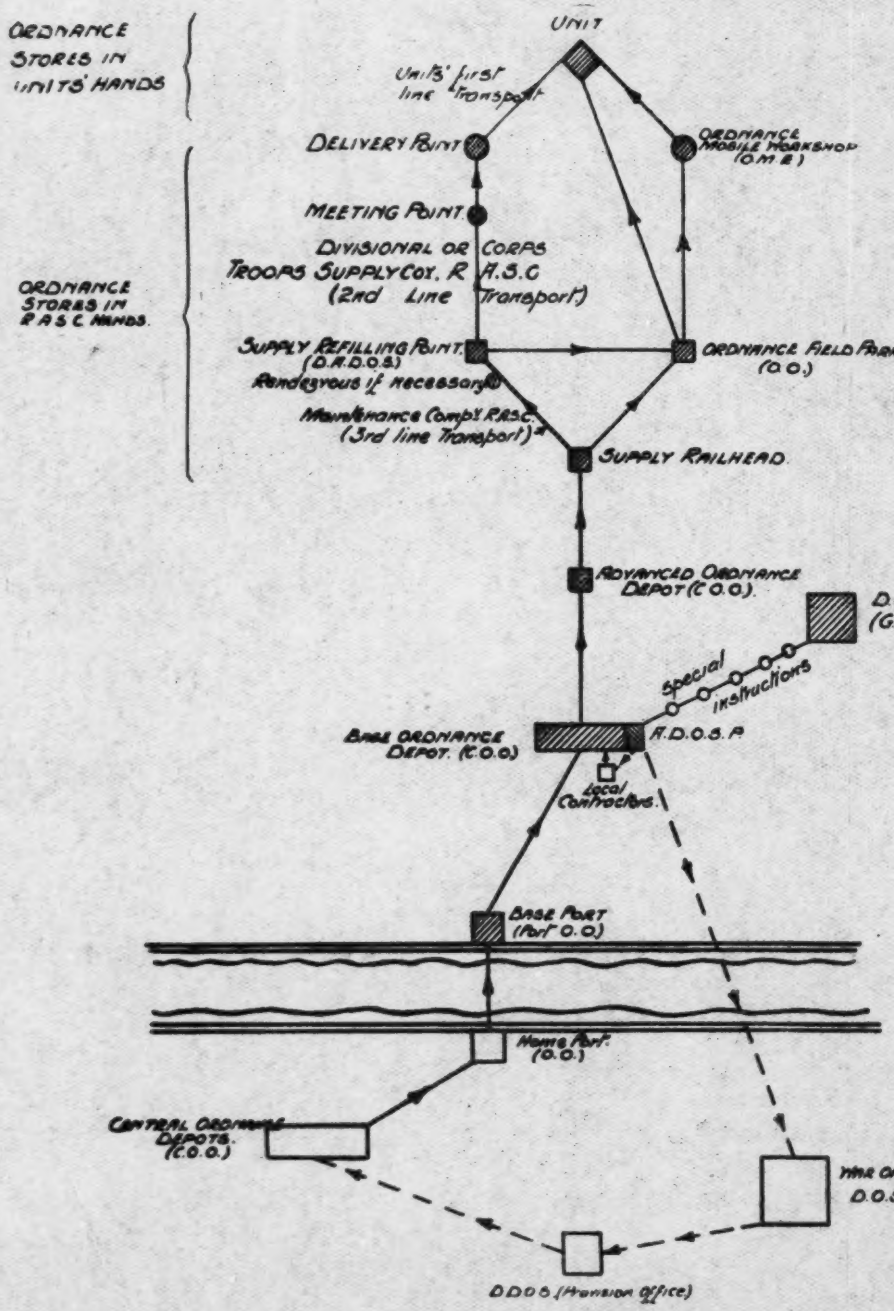


DIAGRAM A.

UPPLY OF ORDNANCE STORES IN WAR

1 Indents are submitted by units to the D A D O S of their formation and are then transmitted to Base Ordnance Depot (or Advanced Ordnance Depot if working). Stores are sent forward by Pack Train to supply railhead where they are loaded into the lorries of the Maintenance Company R A S C by the R.O.O. They are conveyed to Supply Refilling Point and handed over to the D A D O S of the formation who hands them over there to unit representatives in the lorries of the second line transport (Division or Corps Troops M T Supply Coy.

2. Guns, Carriages, Limbers, Wagons, M T. M.T. and M T spares are supplied by the same source. In the case of heavy loads such as guns carriages etc. the R A S C arrange delivery by special methods

3 M.T. vehicles are taken over by units at Railhead or at Ordnance Field Park, if units drivers are available; R A O C arrange delivery direct to units, if units drivers are not available.

4. Ordnance Field Park Holds stocks of non-fighting M T Vehicles, gun spares and machine guns, and spares for urgent issues to units and to ordnance mobile workshops Parks deliver to D A D O S of formation and Ordnance Mobile Workshop.
Delivery of vehicles is carried out as in 3 above. Spare parts and spare assemblies required for immediate use are supplied thro' the Ordnance workshop, those required merely to complete equipment of spares allowed by A.F.G 1098 are supplied through D.A.D.O.S of formations by the normal method. (see 1 above)

5 - - - - - - - - Show the demands from A D O S Central Provision Office on home or local contractors.

——————— Show the supply from Central Ordnance Depots to the Base Ordnance Depot and thence to Units in the field.

6. Only one link in the chain of supply from R.P. to unit can be omitted.

D.O.S. (G.H.Q)

WAR OFFICE D.O.S.

the Chief of the General Staff (C.G.S.), the Adjutant-General (A.G.), and the Quartermaster-General (Q.M.G.), but in addition there were various senior officers of technical arms who had direct access to the Commander-in-Chief (C.-in-C.).

The M.G.O. was not represented, although many questions which now concern him were dealt with by the Major-General, Royal Artillery (M.G.R.A.) at G.H.Q. Engineer questions were dealt with by the Chief Engineer (C.E.) in the field, who was not under any of the three principal staff officers named, but was represented at the War Office by the Director of Fortification and Works under the M.G.O.

It is obvious that it will become increasingly difficult for the C.-in-C. to deal with all the technical questions which are likely to arise, and co-ordination is required. In order to achieve this co-ordination, it has been decided that the M.G.O. will be represented in the field, and that these four principal staff officers should be the advisers to the C.-in-C. It was also evident that, if none of the principal staff officers were to be overloaded, a redistribution of duties was necessary. The Q.M.G. was chiefly concerned.

We have now the four branches of the Staff represented in the field by the Chief of the General Staff, the Deputy Adjutant-General, the Deputy Quartermaster-General, and the Deputy Master-General of Ordnance. As heads of their four branches these principal staff officers are responsible for the initiation, co-ordination and execution of any policy for the work of the Staff throughout an Army in the field, but the responsibility for co-ordinating the work of the Staff rests with the Commander. The C.-in-C. can, when necessary, delegate this responsibility to his senior General Staff Officer, but such delegation in no way prejudices the right of access to the Commander of the heads of the other branches of the Staff concerning matters for which they are responsible. The chief changes in the distribution of duties are as follows:—

(i) The Director of Ordnance Services (D.O.S.), who is responsible for the repair and maintenance of mechanized vehicles other than R.A.S.C., the supply of ammunition and most of the stores of a technical nature, is now transferred from the Q.M.G. to the M.G.O. In addition, the Director of Artillery (D. of A.) and the Director of Mechanization (D. of M.) have been added to the M.G.O.'s branch as the officers responsible for questions respecting research, design and experiment—the D. of M. for all mechanically propelled vehicles, and the D. of A. for arms, ammunition, anti-gas equipment, technical engineer and signal equipment, except mechanically propelled

vehicles. The duties of these officers are technical. They have the standing of heads of services. The D. of A. and D. of M. are not represented in lower formations.

(ii) The Director of Fortification and Works (D.F.W.), now styled D.W., has been transferred from the M.G.O.'s branch to that of the Q.M.G., who is responsible for the accommodation of troops. He is now represented in the branch of the D.Q.M.G. in the field by the Director-General of Engineer Services (D.G.E.S.), and under him there is a Director of Works and a Director of Engineer Stores, these duties having been separated. The Q.M.G.'s branch responsible for movement and maintenance will now control the administration of engineer material and administrative work to be carried out by the Royal Engineers in the field. The D.W. deals with all engineer work behind the areas of formations. The D.G.E.S. is responsible for the provision, distribution, maintenance, and, where necessary, the preparation of all engineer stores, but not equipment, in the field. The D.G.E.S. will also exercise the general supervision of the technical methods to be employed by engineers in the field.

(iii) The duties of the General Staff are the same, and it remains organized in three sections :—

(*a*) *The Operations Section.*

(*b*) *The Intelligence Section.*

(*c*) *Staff Duties and Training Section.*

The Survey Service under a Director of Survey is also controlled by the General Staff.

To the General Staff have been added three staff officers for artillery, engineers and tanks. They are included to advise the General Staff on questions connected with their arm of the Service, and issue such orders as may be required to be issued to those arms by the General Staff.

The heads of Services, who are advisers to the Staff, may issue technical instructions on matters concerning their Services to subordinate formations with the authority of the senior staff officer of the branch concerned, but with this exception, all orders and instructions on administrative matters will be issued by the Staff.

I do not propose to go into the question of the staffs of lower formations, but should like to mention the representatives of the artillery and engineers in the army and corps.

In the army there is a Major-General Royal Artillery (M.G.R.A.) and a Chief Engineer (C.E.). The M.G.R.A. may be called upon to take

executive command of the whole or part of the artillery in the army area and will, in any case, co-ordinate the action and lay down the general policy for this arm. The C.E. is not a Commander: his duties are mainly advisory.

In the corps there is a Commander Corps Royal Artillery (C.C.R.A.) and a Commander Corps Medium Artillery (C.C.M.A.). The C.C.R.A. commands the artillery allotted to the corps as corps troops and the artillery survey company, and is responsible for counter-battery work; he may also be called upon to take executive control of all corps artillery. The C.C.M.A. commands the medium and heavy artillery allotted to the corps, and is the representative of the C.C.R.A. in the forward area.

V. Cavalry.

A cavalry regiment is now allotted to each division for local protection and reconnaissance. The inclusion of these regiments in the division must be a great help to infantry, who will be saved many of the fatiguing duties of searching concealed areas to their front and flanks, and will increase their rate of progress.

The cavalry division is the largest self-contained formation. It consists of two cavalry brigades with the necessary artillery, engineers and ancillary services added.

Two cavalry regiments have been converted into armoured car cavalry regiments, and form part of the cavalry division. Their inclusion gives additional security and mobility to the cavalry, their chief role being distant ground reconnaissance.

The cavalry regiment is organized into two sabre squadrons and a Vickers' machine gun squadron.

The Hotchkiss gun has been discarded, and the cavalry has at present no light automatic other than Lewis guns for anti-aircraft purposes. Until armed with a suitable automatic weapon it cannot be said what its future organization will be, as this will depend on the performance of this weapon which may enable a reduction in Vickers' guns to be made.

The first line transport in cavalry is now mechanized, and approximately two stone has been taken off the horse, which again increases mobility.

Field squadrons R.E. and cavalry field ambulances have been mechanized, which gives them a greater radius of action and allows self-contained detachments to accompany isolated units.

Motor horse ambulances have been added to the mobile veterinary sections.

The inclusion of motor vehicles in cavalry formations necessitates the addition of cavalry divisional ordnance workshops.

With the aeroplane used for long distance reconnaissance and photography, the armoured car for distant and the cavalry for medium and close reconnaissance, followed in rear by infantry patrols, it will be seen that movement of large masses of troops undetected is becoming increasingly difficult, and local protection on the move is much strengthened.

VI. Artillery.

The medium and army field artillery brigades are in process of mechanization, the divisional artillery at present remaining horsed. Both the army field brigades and divisional artillery mobilize with six-gun batteries, the proportion of guns to howitzers being unaltered. The light artillery remains on a pack and draught basis, but experiments are being carried out with a 3.7 howitzer mechanized. An artillery survey company consists of headquarters, one flash spotting section, one sound ranging section, and survey sections form part of each corps artillery. The divisional and brigade ammunition columns have been abolished, and are replaced by the ammunition companies, R.A.S.C., and the maintenance companies.

The supply of ammunition is carried out from ammunition railhead to the ammunition refilling point by the ammunition sections of the maintenance company. Thence onwards it is carried by the divisional ammunition company, R.A.S.C. The divisional ammunition company is divided into four sections, Nos. 1, 2 and 3 for artillery ammunition, each serving a brigade of field artillery : the fourth section carries S.A.A. and the ammunition for the light artillery. When an action is imminent or in progress, forward ammunition points (F.A.P.) will be found from R.A. personnel attached to the divisional ammunition company. They consist of R.A. personnel on motor cycles under an artillery officer, and their duty is to keep touch with artillery brigade headquarters and batteries. According to the position and task of the light artillery, the ammunition of 3.7-in. howitzers may or may not be supplied through the F.A.P. Normally, No. 4 section carrying S.A.A. will move to a position behind the infantry, and will keep touch with the infantry brigade ammunition reserve by R.A.S.C. despatch riders, attached for that purpose. The same system with modifications, applies to cavalry divisions and corps troops. (*See* diagram B.).

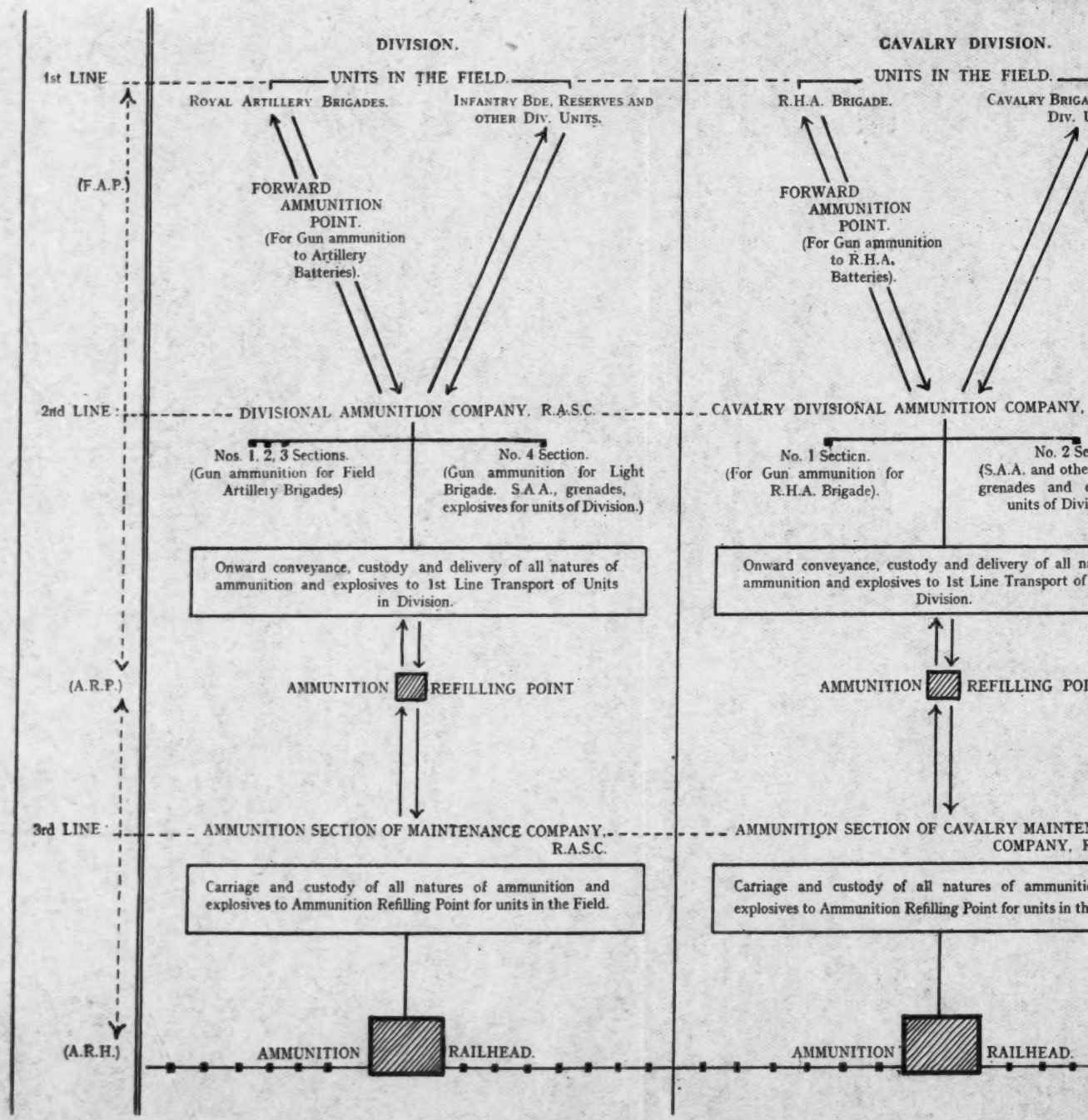
VII. Engineers.

Mechanization has added to the difficulties of the task of the engineer in the field, especially as regards bridging and road maintenance. A lecture on bridging was recently delivered before this Institution[1], so that I do not propose to repeat any details of that subject. Field squadrons

[1] Modern Military Bridging—Journal of February, 1930.

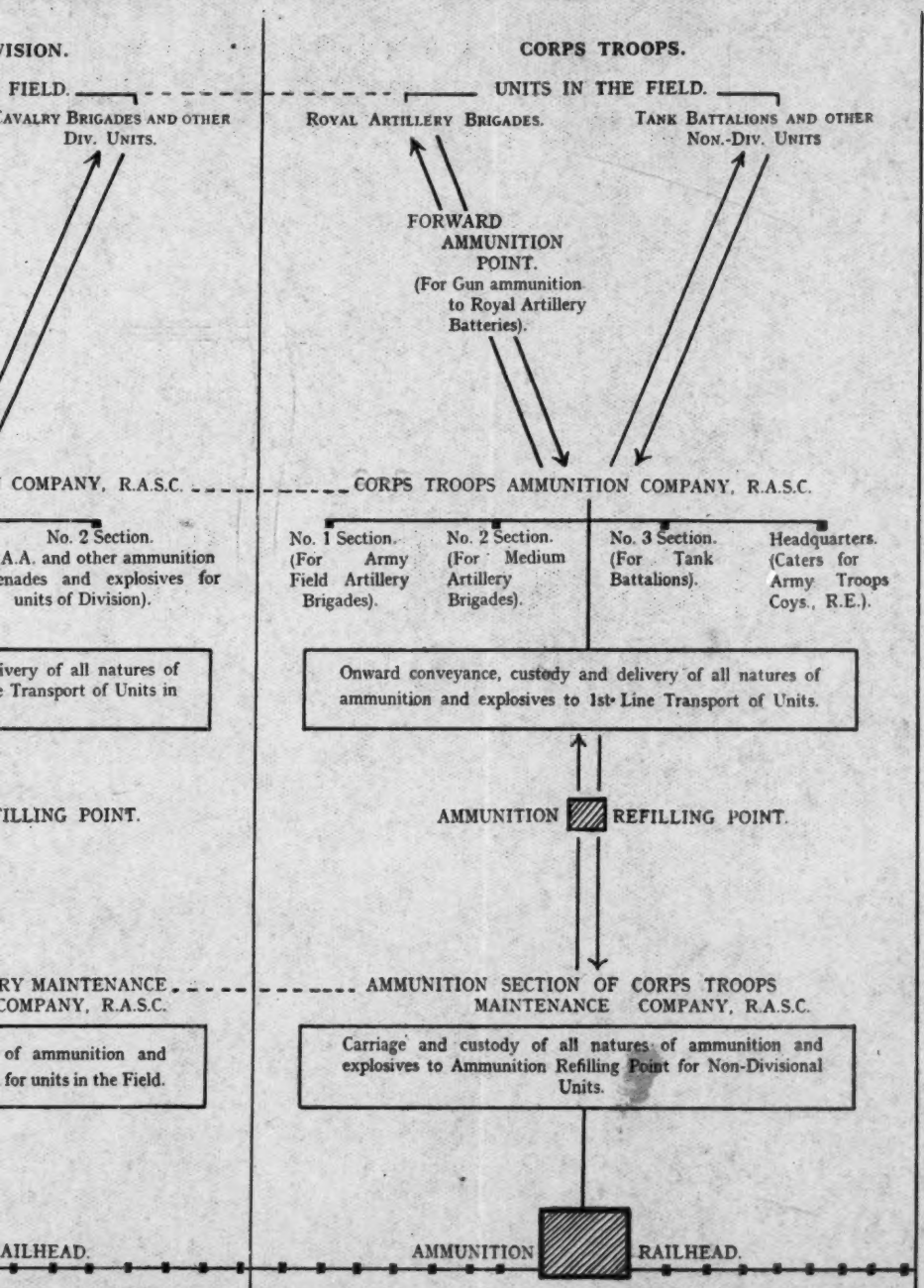
DIAGRAM

NORMAL SYSTEM OF SUPPLY AND REPLENISHM


DIVISION.
CAVALRY DIVISION.
1st LINE
UNITS IN THE FIELD.
UNITS IN THE FIELD.
ROYAL ARTILLERY BRIGADES.
INFANTRY BDE. RESERVES AND OTHER DIV. UNITS.
R.H.A. BRIGADE.
CAVALRY BRIGA
DIV.
(F.A.P.)
FORWARD AMMUNITION POINT. (For Gun ammunition to Artillery Batteries).
FORWARD AMMUNITION POINT. (For Gun ammunition to R.H.A. Batteries).
2nd LINE
DIVISIONAL AMMUNITION COMPANY, R.A.S.C.
CAVALRY DIVISIONAL AMMUNITION COMPANY,
Nos. 1, 2, 3 Sections. (Gun ammunition for Field Artillery Brigades)
No. 4 Section. (Gun ammunition for Light Brigade. S.A.A., grenades, explosives for units of Division.)
No. 1 Section. (For Gun ammunition for R.H.A. Brigade).
No. 2 Se
(S.A.A. and othe
grenades and
units of Divi
Onward conveyance, custody and delivery of all natures of ammunition and explosives to 1st Line Transport of Units in Division.
Onward conveyance, custody and delivery of all n
ammunition and explosives to 1st Line Transport of
Division.
(A.R.P.)
AMMUNITION REFILLING POINT
AMMUNITION REFILLING POI
3rd LINE
AMMUNITION SECTION OF MAINTENANCE COMPANY, R.A.S.C.
AMMUNITION SECTION OF CAVALRY MAINTE
COMPANY,
Carriage and custody of all natures of ammunition and explosives to Ammunition Refilling Point for units in the Field.
Carriage and custody of all natures of ammuniti
explosives to Ammunition Refilling Point for units in th
(A.R.H.)
AMMUNITION RAILHEAD.
AMMUNITION RAILHEAD.

AGRAM B.

PLENISHMENT OF AMMUNITION IN THE FIELD


ISION.
CORPS TROOPS.
FIELD.
UNITS IN THE FIELD.
AVALRY BRIGADES AND OTHER DIV. UNITS.
ROYAL ARTILLERY BRIGADES.
TANK BATTALIONS AND OTHER NON.-DIV. UNITS
FORWARD AMMUNITION POINT. (For Gun ammunition to Royal Artillery Batteries).
COMPANY, R.A.S.C.
CORPS TROOPS AMMUNITION COMPANY, R.A.S.C.
No. 2 Section. A.A. and other ammunition enades and explosives for units of Division).
No. 1 Section. (For Army Field Artillery Brigades).
No. 2 Section. (For Medium Artillery Brigades).
No. 3 Section. (For Tank Battalions).
Headquarters. (Caters for Army Troops Coys., R.E.).
ivery of all natures of e Transport of Units in
Onward conveyance, custody and delivery of all natures of ammunition and explosives to 1st Line Transport of Units.
TILLING POINT.
AMMUNITION REFILLING POINT.
RY MAINTENANCE COMPANY, R.A.S.C.
AMMUNITION SECTION OF CORPS TROOPS MAINTENANCE COMPANY, R.A.S.C.
of ammunition and for units in the Field.
Carriage and custody of all natures of ammunition and explosives to Ammunition Refilling Point for Non-Divisional Units.
AILHEAD.
AMMUNITION
RAILHEAD.

G.H.Q. TROOPS.

In the case of G.H.Q. Troops, only one R.A.S.C. Maintenance Unit is contemplated, i.e. :—

A G.H.Q. TROOPS MAINTENANCE COMPANY, R.A.S.C.

This Unit is so constituted as to embody the 2nd and 3rd Line Echelon Systems existent in Corps and Divisions.

When Units of G.H.Q. Troops, such as Anti-Aircraft Brigades, Field and Heavy Artillery Brigades, are detached to Corps or Divisions, their complement of 2nd and 3rd Line Ammunition-carrying vehicles are similarly detached to the Ammunition and Maintenance Companies, R.A.S.C., of the Corps or Division concerned.

R.E., as I have stated, are now mechanized. Field companies R.E. remain on a horsed basis for the present, but this is a unit in which there are obvious advantages to be gained by mechanization. Field companies and field park companies form the divisional engineers of the division.

The duties of the field companies have not changed. The field park company assists the divisional engineers by executing rear works, such as camp construction services, and holds certain bridging equipment and labour-saving plant as may be required. They also man the electric light plant for divisional headquarters.

The pontoon bridge park has been transferred from the R.E. to the R.A.S.C., as 80 per cent. of the personnel of this unit consist of drivers; the R.E. personnel are attached for the purpose of maintaining the bridging material.

Non-divisional R.E. units consist of army troops companies, electrical and mechanical companies, workshop units and anti-aircraft searchlight battalions.

VIII. Infantry.

The division is still the largest formation of the field army, which is permanent in composition. It consists of three infantry brigades and other arms in proportion.

Infantry brigade headquarters have been partially mechanized.

The infantry battalion now consists of a headquarter wing, three rifle companies and a machine gun company armed with sixteen Vickers' guns carried in horsed limbers. Experiments are being carried out with machine guns and 3-in. mortars carried in armoured carriers. These machines, having greater mobility and being less vulnerable than the horse-drawn vehicle, allow the weapons carried to be used in a more forward role.

Four anti-tank guns are included in the headquarter wing of the battalion, and two Lewis guns have been added for anti-aircraft defence.

The first line transport remains horsed.

Since the war, many writers have predicted the elimination of the infantryman, but, if that should happen, it is difficult to understand who then will do the work which the infantryman now does. It is obvious that if other methods are available, and ground permits, the infantryman will not be asked to undertake tasks that can be done better by other arms. But his duties in the future will be much the same as in the past, and he will have additional work to perform.

What the infantryman asks for is mobility and fire power; if you add armour he becomes something that is not infantry. Movements of

infantry by bus or lorry, both strategical and tactical, will be necessary in the future, and infantry may often be required to move by this method in support of armoured formations.

To allow infantry to do so it is essential that its equipment be light, so that on arrival at its destination it can go into battle with its full fire power. That means its weapons must be portable, and that it must possess sufficient fire power to advance, so to speak, under its own steam and hold the ground occupied until such a time as it can be supported.

Whatever the future organization of infantry may be, I hope the infantryman will remain infantry and not become a hybrid. As I see it, the tendency of the present day abroad is for the rifle and bayonet to become a secondary weapon, but one which cannot be dispensed with, while fire power in future will be produced by the light automatic. Some foreign battalions carry as many as sixty-four of these weapons, each weapon having a performance equal to that of the machine gun and capable of being used either as a light automatic or in the role of the machine gun.

As an alternative to the automatic machine gun there are those who advocate the automatic rifle. One is a team weapon and the other is an individual weapon. I do not wish to open up a controversial subject, but I think the disadvantages of an automatic quick-firing rifle in the hands of the individual, with the attendant difficulties of ammunition supply, should be obvious to those who have practical experience of the infantryman in war.

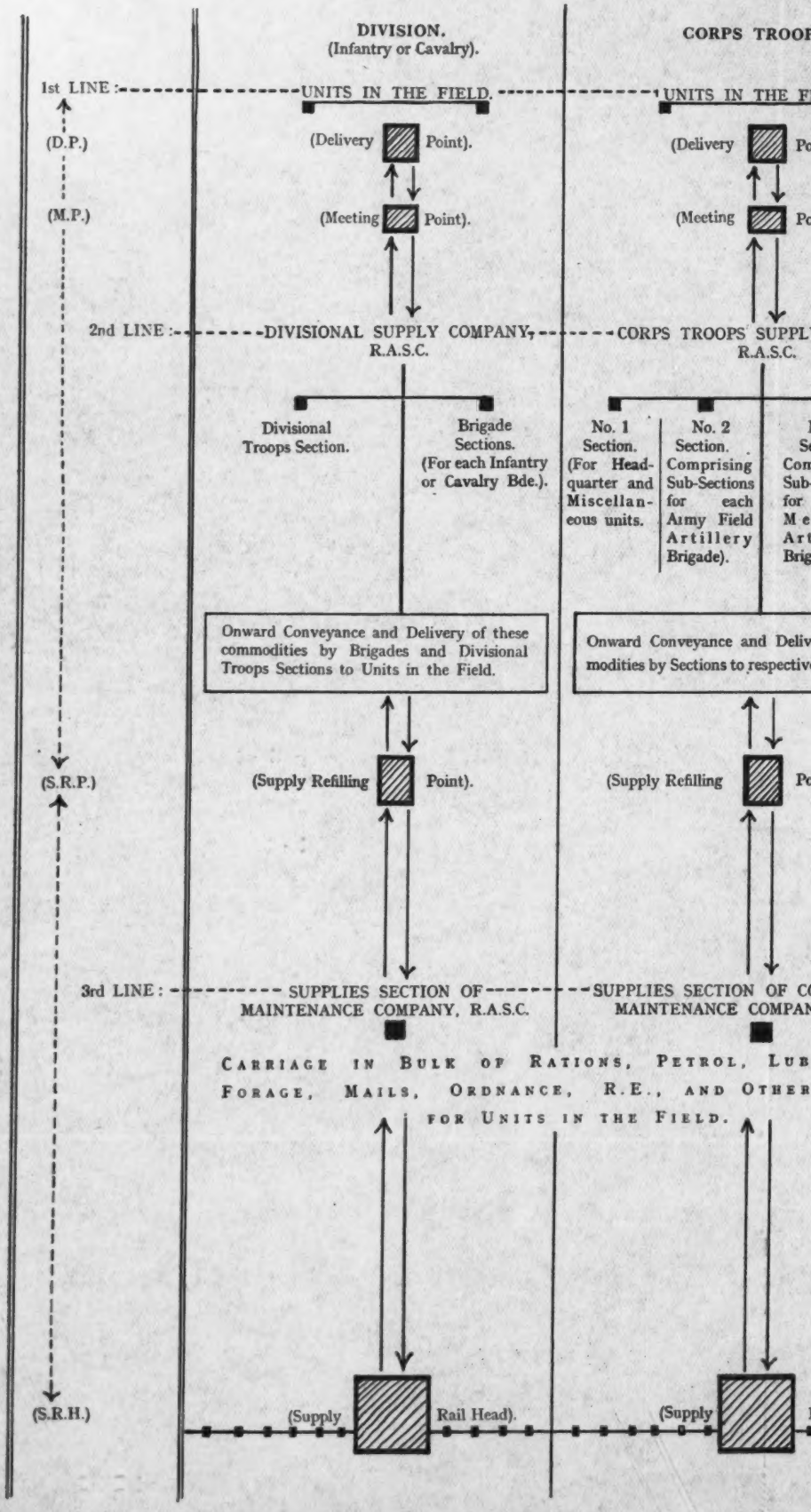
IX. Royal Army Service Corps.

I have already mentioned the abolition of the B.A.C. and D.A.C. and their replacement by R.A.S.C. ammunition companies. In addition, I have mentioned the pontoon bridge park, which has been transferred from the R.E. to the R.A.S.C. The R.A.S.C., with the exception of the advanced horse transport depot, is now entirely mechanized. This change over from a combination of the horsed and motor vehicles to an entirely new mechanized organization has been in itself a very difficult problem.

The old organization has been replaced in the division by maintenance companies for a division and divisional baggage, supply and ammunition companies. Supply sections of the maintenance companies supply direct from railhead to supply refilling points; at this point bulk is broken and the supplies are carried forward to units by the divisional supply company. The supply company is divided into brigade sections and a section for divisional troops. The same system applies to corps troops with modifications which allow for the supply section of any unit transferred from one corps to another to join the parent unit of the

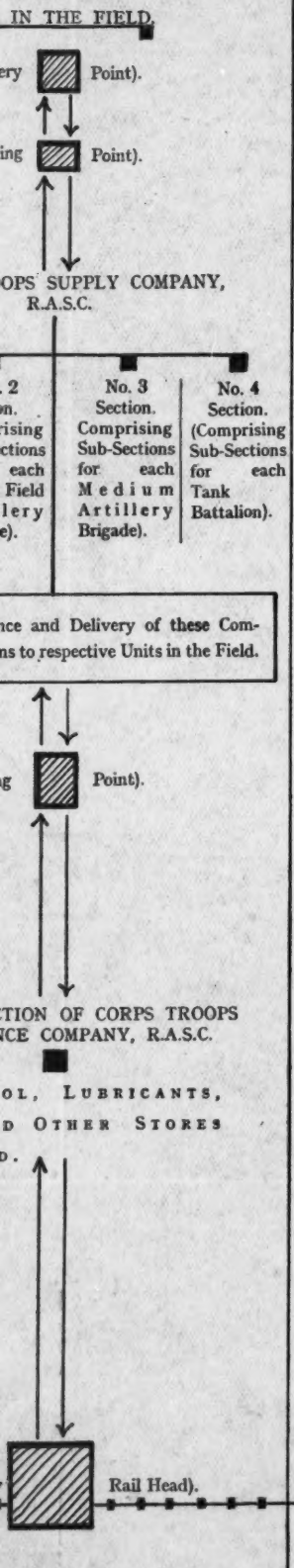
DIAGRAM C.

NORMAL SYSTEM OF MAINTENANCE OF SUPPLIES (i.e. RATIONS, F


DIVISION.
(Infantry or Cavalry).
CORPS TROOP
1st LINE :
UNITS IN THE FIELD.
UNITS IN THE F
(D.P.)
(Delivery Point).
(Delivery Po
(M.P.)
(Meeting Point).
(Meeting Po
2nd LINE :
DIVISIONAL SUPPLY COMPANY, R.A.S.C.
CORPS TROOPS SUPPL R.A.S.C.
Divisional Troops Section.
Brigade Sections. (For each Infantry or Cavalry Bde.).
No. 1 Section. (For Head-quarter and Miscellan-eous units.
No. 2 Section. Comprising Sub-Sections for each Army Field Artillery Brigade).
Onward Conveyance and Delivery of these commodities by Brigades and Divisional Troops Sections to Units in the Field.
Onward Conveyance and Deliv modities by Sections to respectiv
(S.R.P.)
(Supply Refilling Point).
(Supply Refilling Po
3rd LINE :
SUPPLIES SECTION OF MAINTENANCE COMPANY, R.A.S.C.
SUPPLIES SECTION OF C MAINTENANCE COMPAN
CARRIAGE IN BULK OF RATIONS, PETROL, LUB
FORAGE, MAILS, ORDNANCE, R.E., AND OTHER
FOR UNITS IN THE FIELD.
(S.R.H.)
(Supply Rail Head).
(Supply

ATIONS, PETROL, etc.) AND STORES IN THE FIELD

RPS TROOPS.



G.H.Q. TROOPS.

In the case of Units in G.H.Q. Troops, only one R.A.S.C. Maintenance Unit is contemplated, i.e. :—

A G.H.Q. TROOPS MAINTENANCE COMPANY.

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When Units of G.H.Q. Troops such as Anti-Aircraft Brigades, Field and Heavy Artillery Brigades, are detached to Corps or Divisions, their complement of 2nd and 3rd-Line R.A.S.C. Transport Vehicles are similarly detached to the Supply and Maintenance Companies, R.A.S.C., of the Corps or Division concerned.

formation to which it is transferred. Baggage and ammunition companies are similarly divisible and transferable, together with the personnel necessary for the maintenance of vehicles so transferred. (*See* diagram C.).

X. Conclusion.

Within the short compass at my disposal it has only been possible to describe in broad outline the many changes that are taking place, and because I have not mentioned certain arms of the Service it does not in any way mean that the progress they have made is unimportant. I have said little or nothing about armoured formations, as they do not exist as such and are still in the experimental stage. It is as well to remember cavalry and infantry are the arms on which we still chiefly depend, and that their importance has in no way diminished.

Lastly, we have to bear in mind that the rate of progress in reorganization is limited by finance. A period of economy on armaments has set in, and, as we have no capital, we have to do the best we can with the limited resources we have in the way of income. Therefore progress will necessarily be slow.

DISCUSSION.

Captain C. F. Webb: I should like to ask whether it would be possible to have the Royal Corps of Signals made responsible for signals up to infantry machine gun companies and rifle companies.

I venture to suggest that the Royal Corps of Signals might take the place of regimental signallers by allotting to each battalion a commander, an officer and the necessary N.C.O.'s and men direct from this Corps, who are specialists in this highly important function. The question of extra funds to allow of this would be infinitesimal, as the regimental signallers could be reduced in ratio.

Major J. F. Whitacre Allen: Could the lecturer tell us something about the provision of anti-tank guns. There are only two brigades which are provided with these guns at present. Is it proposed at a future date to issue these anti-tank weapons to other brigades?

As regards anti-aircraft work, we were informed lately that there was a possibility of having a Vickers' gun instead of the present Lewis gun. Is that going to be done or not?

The Lecturer, in reply, said: With regard to the Royal Corps of Signals taking over further responsibilities, I think the Royal Corps at the present moment is as full up as it can possibly be with various schemes; but the question which Captain Webb has brought forward is not one that has been overlooked. It has come up for discussion several times. I can only say that it is not proposed at the present time to increase the duties of the Royal Corps of Signals.

With regard to Major Allen's question, I will leave that to the Chairman to answer.

THE CHAIRMAN:

I will first answer Major Allen's question, whether there is any proposal to increase the number of anti-tank guns now issued. Last year we produced a small number of anti-tank guns. That was only what I might call the third of at least four steps which have to be taken before any new weapon can be produced, and before any sound organization can be evolved for the use of that weapon. In this case the first step was a demand made by the General Staff for a gun which could be used in infantry battalions by the unit itself, one which must be simple and have a certain penetration through armour. After many trials and much research work, the weapon was produced. That particular weapon was produced first of all merely as a barrel. It underwent severe tests in the laboratories, which enabled it to be put into some form in which it could be issued to troops as an experimental weapon. Again it was tried in that new form before being issued to the units. Then a few were taken and a trial made with troops. It happens that directly any new weapon or piece of equipment is tried with troops all sorts of things are found to require modification. So it has happened with this weapon that we have now got. We are trying it for another year before we come to a definite decision as to the way it may be developed. The next time we issue these weapons they will probably be issued in considerable numbers, because they will then be in a much more useful and settled form. But until we have given the research workers an opportunity of studying the improvements suggested by the troops themselves, and have got them to work out some solution to these problems, we shall not have a sealed pattern of the desired gun. Therefore, it will be seen that before more useful guns can be issued a considerable time must elapse.

With regard to anti-aircraft guns, Major Allen has gone much faster than is possible for those who have to do the work, much faster even than the constitution of the country will allow us to go. It was suggested that there really was no reason—though certain pundits said there was—why a Vickers' gun should not become a perfectly efficient anti-aircraft weapon, perhaps even more efficient than what we have now. Therefore we suggested to the research experts that they should see what they could do. They made their trials, and their reports are very promising indeed. But again it will be some time before we can adopt this machine gun for the purpose, should it be decided to do so.

I should like to draw attention to one or two points that make the organization of the British Army for war a matter of difficulty. It is, of course, the job of the fighting Services to adapt to a special purpose the normal activities of the State. Any army has a difficult problem to solve when it sets to work to do that, and the British Army has, perhaps, a task of far greater difficulty than any other. Think, in the first place, of the constitution. Those who have studied the Army Estimates will know that the first vote on the list is called Vote "A." That vote gives the number of men which it is legal to raise. That is not really the strength of the British Army, and there we have a difficulty at once. That figure really represents the greatest number of men that the British Parliament are willing to pay for, and the number is reached in this way: the total garrisons abroad are first of all calculated, and from that is worked out the number of men that the units at home require to train in order to keep the garrisons abroad at their proper strength. The latter number is then added to that portion of the garrison abroad for which the British Parliament pays—that is to say, the garrison of places like Gibraltar and Malta and so on, but not India. When these two figures are added together we get a number, usually about 150,000, which is called

vote " A." Of that vote " A " a certain proportion represents the Army at home, and from the point of view of the provision of money, the only purpose of tha Army is to train the men required for service abroad. That is the only way in which the strength of the British Army is calculated, and there is no consideration of any sort of the function it may have to perform. Really, therefore, the Expeditionary Force is a sort of by-product. No calculation is really made of what we need strategically; Parliament does not consider that, but only the number of men that are necessary to be under training at home in order eventually to do what are really police duties abroad.

The next difficulty is that if the British Army takes the field it may be called upon to fight in a country that is flat plain, or in a country that is chiefly swamp, or in a country that is entirely mountainous, and we have to be prepared to go to any of the three at any moment. Therefore, it is necessary to be organized so that we can send a suitable formation into any one of these regions.

We have also to reckon with the fact that the ordinary activities in the life of our nation have been completely changing in character during the last few years. This country, instead of being a horse-using country—indeed, the same thing can be said of practically the whole world—has become a machine-using country. This involves a considerable increase in our difficulties, because the machines are or may be quite unsuitable for some parts of the country to which the army is going, and yet we have to be ready to go at any moment.

A third difficulty to which I want to draw attention is the difficulty of getting things done quickly. I mentioned just now the steps which are necessary before the adoption of any new equipment of any kind: first of all, the demand by the General Staff, then the research by experts, and then, when the pattern is fixed and decided on, the difficulty of finding the money for the purchase of sufficient equipment to supply to the troops. Then comes the issue to the troops, after this again more research, and finally more difficulty in getting the money if the full issue to the troops is decided upon. Each of these steps takes time, and I may say that although an officer's appointment at the War Office lasts four years, it is very seldom that the same officer will both see the beginning of research and a general issue made of some new equipment.

There is yet another point to which I want to draw attention. In the changes described by the lecturer, one principle is to be seen running through the whole of the new organization. In civil life one principle is becoming more and more the rule, this is the employment of specialists, each to do his own particular job. In fact, I believe, in civil life the all-round man is disappearing and the specialist is now predominant. In military organization we are following the rule of civil life. The R.A.S.C. is now taking on new duties; yet if, a few years ago, we had suggested that the R.A.S.C. was capable of carrying and delivering ammunition to the batteries, a great many gunners would have been horribly shocked. But the fact is that the R.A.S.C. are specialists in maintaining and operating motor vehicles, and there is really no reason why they should not drive a motor vehicle just as well when it carries ammunition as they do when it carries bread and meat. Therefore, we make the R.A.S.C. responsible for producing at the delivery point the ammunition, the bridges, and anything else we require.

The customary votes of thanks to the Lecturer and to the Chairman were carried by acclamation.

THE TECHNICAL OFFICER IN THE FIELD

By Lieutenant-Colonel R. Chenevix Trench, O.B.E., M.C.,
Royal Signals.

TO travel hopefully, says R. L. Stevenson, is better than to arrive. That is true, but a man must first know where he is going. The technical officer to-day is travelling fast enough on the stream of change, whether he will or not, and our present purpose will be to define his goal—to see what service he should render in the Army of to-morrow, and what standing that Service should confer on him.

To begin with, who is the technical officer? Or what officer, in this mechanical age, could escape the appellation if he would? No clear-cut definition is needed: speaking broadly, the technical officer is one who fights in the second degree. Normally he leads no troops in battle and he directs the fire of no batteries, but he helps his brother officers who do these things, and makes their task possible. He is combatant, because he may be killed, but he overlaps the division between fighting troops and administrative services. He is exemplified by the engineer, the signaller and the mechanical transport expert. Officers of artillery and tank units are not technical officers in this sense: they fight in the first degree: with all its science their work merely shares in the growing mechanization of modern life, and they need the services of the technical officer the more on that account.

We are English and must look to the past. There have been Chief Engineers since the XIIIth century, and from the first their business was with strong places for defence, with siege works and engines for attack. These included the guns, invented, if we may believe the poet, by Satan himself when his artillery "training their devilish enginery" achieved their short-lived tactical surprise against the army of Heaven. In the XVth century the Chief Engineer was master of the King's Works, Guns and Ordnance. As lately as the battle of Blenheim in 1704 he commanded the Ordnance Train and placed the guns. Yet it was not until 1716 that Engineer officers were formed into a separate corps. It was the beginning of specialization. The new corps remained under the Master of the Ordnance and for nearly two hundred years its members carried on the scientific work of the Army, developing their traditions, making their name and establishing themselves, as institutions were established in those days, apparently for ever. Near the end of the XIXth century we see them based securely on the past, sharing with the artillery the early training at Woolwich, spiritually akin to the

Royal Regiment through many links, but strangely separate from the army—a people apart.

This aloofness was imposed partly from without, partly from within. The spirit of the Chevalier Bayard who would have hanged all such for spoiling war may have had something to do with it. But whatever the cause, in an army which would have hotly disowned the bookish virtues, the Royal Engineer was not only allowed to use his brain; he was expected to do so. Duties of any scientific flavour fell to him as a right, unchallenged save by a few artillery officers. He was paid half as much again as anyone else, and won his commission in jealous competition; in such circumstances it was inevitable that his intellectual supremacy should be as unquestioned as was his technical.

Then came the South African War, and the nation, which generally obtains the army it deserves, began to take notice. A new spirit stirred with the new century, and among the changes which ensued the infantry discovered, to the mutual surprise of themselves and of the engineers, that they could construct their own field works. In those years of change, moreover, the Royal Engineers gave to the world certain children whom the nursery could no longer hold; submarine mining went to the Navy, mechanical transport to the Army Service Corps, aviation to the new Flying Corps. Officers of cavalry, artillery and infantry were called in to the signal service. The unassailable had been challenged and the spell was broken. It was not that the engineers were less good than before; professionally they had never stood higher, but their monopoly was gone; technical knowledge had begun to broaden out. There remained for them the brutal reminder of a reduction in engineer pay when the regimental pay of all arms was increased: under the higher scale of pay for the Army, introduced in 1912, the Sapper subaltern found himself poorer by a penny a day.

The Great War followed, with its hundredfold development of fire, its aircraft, tanks and gas. Through it all the infantryman survived, and survives to-day, as the central figure of war. But what powers are arrayed to-day both for and against him. In the battalion itself the proportion of men who fought with rifle and bayonet in 1914 was ninety per cent.: to-day it is twenty-three per cent., and the rest are used up as Lewis gunners, machine gunners, anti-tank gunners, signallers, orderlies, intelligence section and stretcher bearers. In the latest experiment there were but three infantry battalions in a brigade and the fourth was replaced by a battalion of light tanks and a mortar battery; the implied reduction of the battalions in a division to nine is discussed, and if this change should come to pass, the rifle sections of battalions would contain but seventeen hundred men in a division of seventeen thousand. In an army the non-divisional units of fighting

troops and services swell the proportion against the man with rifle and bayonet: the traditional legionary of the Empire. It is, of course, all for his good, although as he goes afoot through the mud, he may be a little slow to realize it.

So our army to-day is an inverted pyramid, balanced upon its apex of a few thousand riflemen. If they fail, all fails, and it behoves the rest to help them. The help they need is fire and more fire, from the battalions' own weapons, from artillery and from tanks. And although tanks exist first to help the infantry, their very presence demands the tank-of-the-line, created for battle with its peers. This monster again needs the services in battle of lighter types; and tanks of all kinds, whether they co-operate directly with the infantry or indirectly as an armoured force, need artillery support themselves. Artillery fire demands the co-operation of aircraft and survey units. Mechanized guns and armoured fighting vehicles need special bridges, and the engineers want transport to carry the heavy bridging material and machinery.

The volume of fire in battle to-day calls for a supply of ammunition undreamed of in 1914, and this, with all the material needs of an army, involves lorries by the thousand. Lorries and armoured vehicles need an extensive repair organization, an instant supply of spare parts and an unbroken flow of petrol. For there can be no half rations; if petrol fails, the army stops. The commander wants information; he employs aircraft, armoured cars and cavalry to get it for him; and the cavalry itself must have the co-operation of mechanized fire units if it would preserve its mobility. The more complex the organism becomes the more highly developed must be its nervous system of communications.

And so the structure grows, effect upon cause like the house that Jack built. It is technical through and through. At every stage, and to an extent which increases every year, it depends upon applied science, while scientific technique to-day conditions the conduct of war. Then what of the commander? Is he to be soldier or technician, or can he be both? To follow his art a man must master his medium; but if he has to learn all the machinery of war, how can he see the wood for the trees, or how can he devote himself to the proper study for a commander—that of human nature? The answer lies in the relation between himself and his technical officers.

Clemenceau said of two statesmen that the one knew everything and understood nothing, the other knew nothing and understood everything. In the sense of this epigram we may say of the commander and the technical officer that each should know his own work and understand the other's. In the person of the commander there are two extreme types to avoid; the one who says "I order operations: it is for you

to deal with any technical obstacles" ; the other " I must do what the experts say." If, however, he knows his own work and understands theirs he will consult his technical officers, weigh their difficulties against his needs, then make his decision.

It is the technical officer, however, and not his commander with whom we are now concerned. First and foremost he must be a soldier, his character based upon discipline and the military virtues without which all his accomplishments will avail little. For he is a man under authority, one of a brotherhood where each man's honour lies in the service he gives. And so he must loyally accept a " No " if he should receive it in answer to his representations ; if told that there is to be no straw for his bricks, he must cheerfully work without it.

Then he must know his own work, not superficially but fundamentally : he must understand the scientific basis of his profession, he must be educated, in fact, not merely technically trained. It is only thus that the empirical formulæ, the rules of thumb, and all the guesswork which he must perforce apply in the field, can be based on a sure foundation : he must be able at need to refer back to the principles from which they derive. It is, for example, more important for a signal officer to understand something of the laws of radiation than to know by memory which knob of a wireless set to turn. This is a hard saying for some who protest, not without pride, that they are practical workers, plain men unconcerned with theory : such men have their value and are, indeed, indispensable in their place, but that place is not in the commissioned ranks of a scientific corps.

Most officers as they grow senior have to administer and control, leaving the direct technical work behind them. It is only the man educated in principles who will then avoid being dated, with a mind anchored to the technique of his early days. He may lose immediate touch with design, but he will understand the trend of progress and will recognize truth when he sees it. He will know what to do when he meets the inventors of perpetual motion and the death ray. He cannot to-day, even in his own branch, know everything, but he should be a Jack-of-all-trades and, while still junior, master of one. He must know broadly what is going on in his line in the civilian world of engineering and research.

Yesterday the technical officer was the Royal Engineer, and any one so equipped needed only to add a working knowledge of army life, and he was fit for his duties. For these duties, although they were indispensable to the Army, were something apart from its daily round : he was, as it were, the expert called in to help. But to-day this is changed, and without him the Army can neither move nor fight. He

must know intimately, as an integral part of it all, how it moves and fights, and especially how it thinks; he must in fact be of the Army and not merely in it. Tactics and organization are his proper study, and they must be the background against which he examines every technical problem.

He must understand the point of view of the fighting units whom, directly or indirectly, he serves, and especially of the infantry, in so far as it can be understood by one who does not suffer with them in war; and he should understand it not from books but from personal association. If he is an officer of the Royal Engineers or Royal Signals he takes the right of the infantry on parade, but he is their servant in the field, and he should be equally proud of both distinctions. Should he find himself in a mixed force of which he is the senior officer, he must assume his responsibility of command without hesitation or afterthought.

Thus endowed, he can understand his commander's problems and see with his eyes, and his technical solutions will bear their true relation to the military problem. He can ask and give himself the answer to the historic question: "De quoi s'agit-il?" He will not, in difficulties, take refuge in the priestcraft of his trade, but will, on the contrary, look upon his own technical advice as suspect unless it can be expressed in plain language. He will keep his commander posted in what matters without worrying him with technicalities, and over his own troubles he will consume his own smoke. Knowing his commander's general intention he will not say "What am I to do?" but "May I do this?"

The question may be asked—in fact it was asked a few years ago in this Journal—if he has to know so much both about the conduct of war and its technique, will not the technical officer be better qualified for high command than his non-technical more purely combatant brother, who knows one side of war only? It is accepted that the man with the wider knowledge must control and the specialist must advise, and in the past the technical officer has been the specialist; but which of the two will have the wider knowledge in the future? It will be the technical officer, if he uses his brains and his opportunities. Yet it may often happen that in the everyday competition of Army life, he may be debarred from attaining his ambition by reason of his having specialized in his calling. It is a compliment paid to his intellectual powers, a compliment maybe which he could well spare. He may feel that his very ability stands in the way of his ambition. But before allowing himself the luxury of a grievance, let him think again.

It is true that victory to-day more than ever before depends upon foresight and care in preparation, and his technical work is an admirable school for these qualities. He deals in concrete realities, and so he

learns that two and two infallibly make four : he will not deceive himself that they may become five if it is very important that they should, and if they are not counted too closely. In gaining results he knows how much value to allot to work and how little to anything else ; he learnt it long ago with Newton's laws, and he has been learning it ever since. All this is true, and yet an old combatant instinct warns us that it is not the whole truth. For the dominant factor on the battlefield is not science, nor organization nor any material thing : it is death, and a commander in the last resort deals with the spirits of men in their tired bodies. Will the technical officer measure these with his rule, and is his experience after all the best apprenticeship for high command ?

It may give him an understanding of how troops are organized and how handled in battle, but between this and the ability himself to handle them there is a wide gulf. A member of the field may understand what the huntsman is about : to take the horn in person is another matter. Moreover, the technical officer in his work must be troubled about many things, and this does not help him to see with the commander's single eye : nor does his conviction that two and two make four teach him how a commander, working his magic with human nature, may sometimes make them into five or even ten. He learns to expect more or less complete data before coming to a conclusion, whereas the commander who waits for complete data is lost while he hesitates.

Beyond all this, there is the fact that the technical officer has not himself known the worst of war. An infantryman in command, when he commits his battalions to battle, will at least be sending them into what he has faced himself, or offered himself to face, as a regimental officer. With the technical officer this is not so : although he offers his life as gallantly as the other, he does so far less frequently, and in hardship as well as in danger he seldom feels the worst that war has to inflict. It is true that this has nothing to do with ability, but there are few generous minds who would not feel the handicap.

In short, although he may have resolution, ability and knowledge, and although his ranks have produced illustrious leaders, including a Napier and a Kitchener, the habit of mind formed by a technical officer's experience alone is not necessarily well suited to high command.

For most staff duties, on the other hand, if he has the right personality, his special abilities and training fit him admirably. Under modern conditions, moreover, the value of the staff officer who has some technical experience is increasing, and when he goes back periodically to regimental duty the widened horizon which he has gained during his staff employment is invaluable to his corps. Some limitation there must be, for the right feeling between the staff and the fighting

units could not exist unless a majority of staff officers came from infantry, artillery, cavalry or tanks, and staff thought in any case must not be technically biassed.

If it were merely a question of choosing the best workers from the Army and sending them to the Staff College, with limitations to ensure a proper balance of arms, it would be easy to say—enlarge the technical entry. But the question is not so simple. The technical arms themselves need all the ability they can get, and more, while they are too important to the Army to be bled of their best for staff employment. The position is governed by the fact that, although the technical officer may do staff work, there is no one else who can do his technical work: that is why he gets extra pay, a point which he sometimes overlooks when he complains of restricted opportunity. And so, although the proportion of technical officers taken for the staff might be greater than it is to-day, with advantage to the Service, it could not be much greater.

The technical officer, then, like every good soldier, finds his honour and his prestige in the work itself, and not in any prospect it holds out of high command or staff employment. Prestige is made up of many factors, most of them imponderable. Were we a militarist race, it would depend much upon the degree of combatancy, and a technical corps would be felt by the nation and the army, and would feel itself to be inferior to the fighting infantry whom it served. With us this has little to do with it: take, for example, that first of technical corps, the Royal Engineers; like all great institutions it has its enemies, but the worst of them would not accuse its officers of an inferiority complex.

There is one glory of the sun and another glory of the moon, and while the fighting units have their pride the technical soldiers have theirs, differing in kind but not in degree. Our people are not by nature sympathetic towards what they fancy to be the military type, but there is something which appeals to the national genius in the ideal of the soldier-craftsman trained alike to handle his tools and his rifle, fighting with the best at need but primarily occupied with his trade. And so with his officer: the scientific half of him tempers the military and each adds lustre to the other. While there was, perhaps, no technical officer in the Great War who did not feel humbled as his brethren of the infantry came past him out of the line, yet human nature is complex and this tribute to the man who suffered most could exist side by side with the highest pride in his own corps and work.

For two hundred years the Royal Engineers made their appeal to men of ability and good family, who were attracted to a soldier's life but had no taste for the vacuity which too often accompanied it in the XVIIIth and XIXth centuries. Others to-day share with them the

technical work of the Army, notably the Royal Signals, who stand to them as younger brothers. And while few now would describe the life of the regimental officer as vacuous yet the contrasting appeal of scientific soldiering persists; there will always be the lad of quality with technical leanings, who would be a soldier but needs something special for his mind to bite upon. The technical arms to-day enjoy a new advantage in the fact that the youth of the nation is machinery mad. It is a phenomenon at which their seniors who found all their joy in a horse may marvel, but which they may not deplore; for we belong to a world where the dwellers, from the beginning, have had to adapt themselves or perish.

To-day, more than ever, technical duties in the field require officers of a quality second to none, who are soldiers and gentlemen, and technical experts in addition. The extra pay, though it has its effect, is little in itself, and the technical arms must rely on other means to draw the men they need. Prestige and the type of officer recruited react mutually upon one another. The best will be attracted to a calling which stands so high that entry is an achievement and membership an honour. Such men enhance the standing of their Service, and this in turn attracts others of their kind. So the cycle goes on, but the initiative must come from within; it comes back in the end to the prestige which the technical branches can win for themselves by their own exertions.

Their position, it is true, requires outward recognition by the award of promotion commensurate with the services they render. And in this imperfect world it may sometimes be necessary for the technical officer himself to assert his position against an attitude which now shows its head rarely—an attitude which says to him: "Thank you; you will be called when you are wanted."

Yet in the result his standing will depend neither upon rank nor self-assertion, but upon his own quality and standard of duty. If he plays his part the Army will not refuse him his due. He will get out of life what he puts into it, and his profession will give him more opportunities than most of putting into it the best of his manhood. The quotation which introduced our present thesis implies that arrival will bring disillusionment, but if the ideal which the technical officer seeks has been truly stated he may take heart: there is no immediate danger.

PROPAGANDA IN WAR[1]

By Paymaster Lieutenant-Commander H. M. Horne, R.N.

MANY people, if asked to define the meaning of propaganda, would describe it generally as a practice resorted to by political agitators, an insidious campaign conducted with an economy of the truth and often with some nefarious object in view; at the worst, sheer anarchy; and at the best, something not entirely above board.

Propaganda has been academically defined as the term applied to a concerted scheme for the promotion of a doctrine or practice; more generally, the effort to influence opinion and to promote the interests of those who contrive it rather than to benefit those to whom it is addressed.

It is our present purpose to show the development of propaganda from the unrecognized hobby of a few individuals to a scientific and potent weapon which had a very important influence on the war of 1914–1918.

The Role of Propaganda in War.

Military propaganda aims at utilising the psychological factor as an additional resource of warfare. It sets out to mobilize the animosity of the community against the enemy, to maintain friendly relations with neutrals and allies, to arouse the neutrals against the enemy and to break up the solid wall of enemy antagonism. Thus it may be divided approximately under the following headings:—

(*a*) Control of home opinion.
(*b*) Control of allied opinion.
(*c*) Control of neutral opinion.
(*d*) Control of enemy opinion.
(*e*) Counter-propaganda to counter the operations of the enemy.

Before going any further, it is important to grasp the factors governing the conduct of propaganda in each of these departments. In the case of home opinion, it is vitally necessary that the public should be

[1] The Author is indebted to "Secrets of Crewe House," by Sir Campbell Stuart, K.B.E. (Hodder and Stoughton), and "Propaganda Technique in the World War," by H. D. Lasswell (Kegan Paul), for much of the information contained in this article.

favourably disposed to the prosecution of the war. They must be impressed with the justice of the cause, with the economic strength and financial resources at the disposal of the State and the certainty of final victory. It should be the object of propaganda to promote a feeling of buoyant optimism in the face of temporary reverses. It is desirable to emphasize the common effort of all classes of the community and to deal in a temperate and conciliatory manner with any industrial disputes which may threaten to interfere with essential supplies. It is helpful also to give as wide a publicity as possible to breaches of international law on the part of the enemy, and to pessimistic articles in the enemy opposition Press. As an instance of the latter, the German Press greeted the appointment of Foch to the supreme command by reprinting some articles in the French Radical Press which interpreted the appointment as a last straw, admitting that bad leadership had brought about the prevailing sense of failure at the front.

The control and education of allied opinion is very difficult and requires the utmost tact in anticipating points of friction. Propaganda in this department should stress the unity of the objectives amongst friendly states, at the same time paying careful deference to allied contributions to the common cause, and to the cherished war aims of confederates.

Control of neutral opinion acquires considerable importance owing to the necessity for maintaining stable economic relations with non-belligerent powers, and is obviously of still more vital importance where there is a possibility that a neutral may be induced to join forces against the enemy. Serious, though happily not decisive, harm was done during the critical days of 1915, when Italian susceptibilities were wounded by the statement of a French public man that Italy was waiting to fly to the succour of the victor.

Official pronouncements intended for neutral consumption should, where possible, lead the neutral to identify his interests with our own in defeating the enemy. Such pronouncements must be free from suspicion of interference with neutral rights, while, conversely, any infringements of those rights on the part of the enemy can, with advantage, be widely advertised.

Propaganda has been summarized briefly as follows:—

> "The fighting spirit of a nation feeds upon the conviction that it has a fighting chance to win."[1]

Therefore the enemy *morale*, both amongst the fighting forces and the civil population, must be lowered by every possible means. This can be achieved by stirring up disaffection amongst enemy allies *inter se*,

[1] "Propaganda Technique in the World War." By H. D. Lasswell, p. 102.

and by secret support of unruly elements within the enemy countries. Press announcements destined for enemy countries should emphasize the complete inevitability of eventual defeat and the certainty of useless suffering if the war is prolonged.

History of Propaganda in War.

Propaganda in war actually dates from remote antiquity. Herodotus relates that Themistocles in the Persian War attempted to seduce the Ionians and Carians from their allegiance to the Persians. During the American War of Independence, handbills were circulated among the British troops on Bunkers Hill, offering them 7 dollars a month, fresh provisions in plenty, health, freedom and a good farm, should they desert and join the American Army. But it is, nevertheless, true to say that this potent weapon acquired no material significance prior to the World War of 1914–1918.

At the beginning of the Great War, little propaganda emanated from this country, certainly none with official support. Early in 1916, however, a propaganda branch of the Military Intelligence Department was established and, in the spring of that year, a subsection of this branch began the preparation of leaflets in German for distribution amongst enemy troops. One use of the leaflets was to disprove the false beliefs spread among German soldiers that the British and French treated their prisoners with great severity. To counteract this, reproductions of letters, actually written by German prisoners of war, and photographs and descriptions of prisoners and their camps were prepared and distributed. As the political and social discontent in Germany increased, it was thought useful that the German soldiers should be provided with more evidence of the internal conditions in their own country than their officers would allow them to have, and leaflets prepared from German sources, for instance, from suppressed editions of German pamphlets and newspapers, were scattered on the lines and rest billets.

This same department of the War Office also undertook the publication of a weekly news bulletin, entitled *Le Courier de l'Air*, containing news in French for circulation among the French and Belgian inhabitants of occupied districts. This newspaper was distributed by air until the end of the war and was greatly valued by those who would otherwise have been entirely dependent on German sources for their news.

Much useful work was achieved by this department, but the intensive British propaganda effort cannot be said to have commenced until the early part of 1918 when Lord Northcliffe was appointed head of the Department of Propaganda with his headquarters at Crewe House in London. In a memorandum written shortly after his appointment,

Lord Northcliffe pointed out that propaganda must override unnecessary censorship, that it must invariably be based on sound and pre-determined policy, and that the truth should be strictly adhered to. He stipulated that the direction of propaganda in enemy countries should be in the hands of a personnel deeply versed in foreign politics, understanding enemy psychology and having professional knowledge of the art of presenting facts plainly and forcefully.

It was agreed, at a preliminary conference of the newly-formed department, that Austria-Hungary provided the best field for allied propaganda work in the immediate future. The anti-Hapsburg and anti-German sentiments of the several subject races of the Dual Monarchy provided an ideal basis for stirring up disaffection. Of the subject races by far the most numerous were the Czechs and Southern Slavs, and it was agreed that moral and active support should be given to the national desires of these races for independence, also to the encouragement of their disinclination to fight for the Central Empires.

It may be noted here that similar attempts to seduce " oppressed nationals " from their allegiance to the Allied cause were made by the Germans, particularly in Egypt and in India, also amongst the American-Irish.

The next step was the institution of a permanent inter-allied propaganda commission on the Italian front, to which representatives of the committees of each of the oppressed nations were attached. The Commission began work in April, 1918, and issued a weekly journal in the Czech, Polish, Southern Slav and Rumanian languages. The national representatives gave invaluable assistance in the preparation of this journal, ensuring accuracy of translation and suitability of contents. Quantities of literature and posters were despatched to the front and distributed variously by means of aeroplanes, rockets and by contact patrols. Gramophone records of Czecho-Slovak and Southern Slav songs were secured by the British Commissioner and the instruments were placed in no-man's-land.

The cumulative effect of this intensive propaganda campaign was soon apparent. Many deserters came over to the Italian lines and, with few exceptions, volunteered for immediate service against their former comrades. The great Austrian offensive planned to take place in April, 1918, was postponed until June, and, when it was finally launched, the Italian authorities had accurate information concerning the enemy plans and dispositions. In consequence, what might have been a formidable attack was converted into something approaching a rout.

The activities of the allied propaganda commission were by no means confined to operations against the enemy fighting forces. Of all cities

not actually within the zone of military operations, probably none suffered more of the rigours of war than Vienna. Famine and disease were rife, and the civil population were consequently particularly susceptible to propaganda. Italian army aeroplanes dropped enormous numbers of leaflets over the stricken city and undoubtedly achieved most valuable results in promoting civil unrest.

Inter-allied propaganda was also carried on against Bulgaria on a smaller scale. The general lines of the policy to be pursued were somewhat complicated by the fact that the United States was not technically at war with Bulgaria. Furthermore, it was impossible to begin territorial bargaining, first, because Bulgaria already possessed more territory than that to which she was ethnographically entitled, and secondly, care had to be exercised so as not to give offence to Serbia, Rumania or Greece. Eventually, as the simplest solution of the difficulty, it was decided to threaten the Bulgarian Government with political and economic ostracism failing acceptance on their part of certain conditions.

It may be remarked that in the case of Bulgaria there was no strong basis of right on which allied policy could be founded, nor could any prospect of reward be offered in return for the capitulation of that country. It was, therefore, necessary to act on the lines of "little to hope for and much to fear," but it is doubtful whether this high-handed action had much influence on the Bulgarian people. Bulgaria was called upon to suffer the penalties of backing the wrong horse.

The Propaganda Campaign against Germany.

The successful launch of the propaganda offensive against Austria-Hungary raised high hopes for the success of the corresponding campaign against the Germans on the Western Front.

At the invitation of Lord Northcliffe, Mr. H. G. Wells consented to direct the preparation of propaganda literature against Germany. As Mr. Wells regarded German militarism as one of the greatest obstacles to the achievement of a better world order, his attitude of mind was precisely suited to the purpose. He had to be an inventor of war aims, to set up an ideal which would arouse the enthusiasm of those elements in the nation whose support was desired, and to make it clear to them that the chief immediate stumbling block was the military enemy.

Mr. Wells first addressed himself to the task of writing a memorandum on the position of Germany at that time from the point of view of propaganda. The points to be brought home to the Germans were—

(*a*) The determination of the Allies to continue the war until Germany accepted the Allied peace settlement.

(*b*) The existing alliance as a fighting league of free nations would be deepened and extended, and the military, naval, financial and economic resources of its numbers would be pooled until—

(1) Its military purpose was achieved ; and

(2) Peace was established on lasting foundations.[1]

It was obvious that no scheme of restoration could be effected without the sincere and whole-hearted co-operation of the Central Powers, but it was manifestly impossible to invite such co-operation from a Germany and Austria under imperial domination. Allied propaganda, therefore, took the form of pointing out to the Germans that nothing stood between the enemy peoples and a lasting peace but the predatory designs of the ruling dynasties and military and economic castes. Thus the changing of Germany from within became a primary war aim of the allies.

A further line of action was designed to appeal to the German workers. For this purpose Mr. Wells arranged for the preparation and issue of a summary of the British labour war aims, which was subsequently used with considerable effect, not only in Germany but also in Austria.

Much of this propaganda was conducted openly and without attempt to disguise its origin, through German elements in Switzerland and the United States.

Propaganda Amongst Neutrals.

Propaganda methods reviewed up to this point have dealt largely with political and racial problems, and it is now desirable to examine the means adopted by belligerents for the alienation of neutral sympathy from their opponents.

So far as the Allies in the late war were concerned, much stress was laid on the inhuman conduct of the German troops in the field, and on the barbarous methods adopted by German submarine commanders. Practically every Allied Government produced an atrocity brochure. The British appointed a commission, known as the Bryce Commission, composed of men with international reputations for truthfulness, whose function was to collect evidence and deliver findings on German atrocities.

German propaganda frequently took the form of a denial of war guilt on the part of the Central Powers. It accused the Allies, and Great Britain in particular, of jealousy of Germany's commercial advance. It is interesting to remark that this attitude has persisted and increased in post-war Germany, and is manifested in the emergence of an " anti-war guilt " society.

[1] " Secrets of Crewe House." By Sir Campbell Stuart, K.B.E., p. 62.

As a counter to the Allied *Courier de l'Air*, the Germans published the *Gazette des Ardennes* for the consumption of French nationals who lived within the occupied area. The Central Powers also concentrated much attention on stirring up disaffection amongst the Jewish nationals domiciled in Allied countries. In Russia, this effort met with a large measure of success, but elsewhere it was effectively countered in November, 1917, by the action of the British Government, in committing itself to the establishment of a Jewish National Home in Palestine.

THE PRODUCTION AND DISTRIBUTION OF PROPAGANDA LITERATURE.

In 1918 great improvements were made in the speed of actually producing and distributing literature. For this purpose the more important items of news, such as those giving details of military successes, were issued on priority leaflets which were rushed through the printers and reached German hands within 48 hours of being written.

During the period August-October, 1918, over 13 million leaflets were dropped behind the German lines. These leaflets were designed to acquaint the Germans with news concealed by their leaders, and often took the form of maps showing territory gained by the allies. Great stress was also laid on the dwindling of German resources of man-power, whereas the Allies, chiefly through America, were preparing to put an ever-increasing number of men in the field.

The ideal means of distributing propaganda to the enemy troops was, of course, by aeroplane. The Germans, however, perturbed by the success obtained by this method, threatened to inflict severe penalties on airmen captured when performing such duties, and, on capturing two British airmen, followed their threats by action. It is open to question whether reprisals on the part of the British authorities would have had the desired effect, but it was decided that the use of aeroplanes must be discontinued.

Many alternative methods of distribution were tried. Bundles of leaflets were projected from trench mortars and also by means of rifle grenades, and successful results were obtained on a small scale. Another ingenious device was a form of box kite, to the cable of which was attached a messenger fitted with release gear and containing propaganda.

None of these methods proved adequate to the intensive campaign which the Propaganda Department wished to pursue, and finally a special type of balloon was devised for the purpose. The standard balloon stood about 8 ft. high and was made of paper, specially treated to resist the percolation of hydrogen through the envelope. The leaflets, which were attached by a wire to the neck of the balloon, were released by means of a burning fuse, small packets of leaflets being attached by cotton thread at intervals along the fuse in order to ensure distribution

over as wide an area as possible. The release of each packet acted as a discharge of ballast, and thus the balloon, although continually losing gas, kept in the air until the end of its course.[1] The unit for distribution consisted of two motor lorries, which took the men, the cylinders of hydrogen, and the propaganda loaded on releases, to a sheltered position selected by the officer in charge, after consultation with the meteorological experts. A temporary shelter was quickly rigged, the balloons filled, releases attached and lighted, and the whole operation took only a few minutes. It was a curious and fortunate circumstance that practically throughout the late summer and autumn of 1918, the direction of the wind was almost consistently towards the German lines, thus greatly facilitating the liberation of propaganda from balloons.

The Influence of Propaganda in Germany.

German prisoners were carefully interrogated in order to ascertain which particular subjects of propaganda made the most profound impression on the German mind. Chief among these were the responsibility for the war, the illegal introduction of gas warfare and Zeppelin raids on undefended towns, the failure of the U-boat campaign, the magnitude of the American effort and comparison of the food conditions prevailing in Germany and Great Britain.

The turn of the tide of military events subsequent to August, 1918, rendered the German soldiers and, through them, the civil population increasingly susceptible to propaganda. The German people were threatened with inland air raids on an unprecedented scale, with a still more rigorous enforcement of the blockade and with commercial boycott after the war if hostilities were prolonged. Much use was made of wireless for the promulgation of these threats, and quantities of literary propaganda were introduced into Germany through the book trade inside covers of harmless appearance. Enemy newspaper correspondents in neutral countries were carefully nursed and, during the latter stages of the war, the German Socialist Press contained much outspoken comment and criticism of the conduct of the country's affairs by the militarist party.

Evidence was soon forthcoming of the effect of the intensive propaganda campaign. The censorship in Germany was removed and, except in the Socialist papers, a flood of invective from editors and generals alike appeared in the German Press. Hindenburg personally issued a long manifesto in which he admitted the effect of propaganda at the front and inside Germany. He exhorted the army and the people to remember that all propaganda emanated from enemy sources, and

[1] "Secrets of Crewe House." By Sir Campbell Stuart, K.B.E., p. 58.

was intentionally harmful to Germany. German army orders captured by the Allies showed that officers and men were threatened with severe punishment if they neglected to hand in immediately any leaflets which they might find.

The *Deutsche Tageszeitung* commented: "We Germans have a right to be proud of our General Staff. We have a feeling that our enemies' General Staffs cannot hold a candle to it, but we also have the feeling that our enemies have a brilliant Propaganda General Staff, whereas we have none."

Post-war tributes from the enemy are even more striking. In July, 1919, a German author of repute wrote: "It cannot be doubted that Lord Northcliffe very substantially contributed to England's victory in the world war. His conduct of English propaganda during the war will some day find its place in history as a performance hardly to be surpassed." The Northcliffe propaganda during the war correctly estimated the character and intellectual peculiarities of the Germans. That the psychological factor was of the utmost importance is certainly true, but in contrast to German propagandists Lord Northcliffe never committed the cardinal error of making use of lies or of statements liable to be disproved. Each successive step was the result of careful thought and consideration for the policy approved by the Cabinet. This factor also is recognized by Ludendorff, who wrote in his war memoirs: "Good propaganda must keep well ahead of actual political events. It must act as pacemaker to policy and mould public opinion without appearing to do so."

Peace Terms Propaganda.

Granted that war propaganda should conform to the lines of predetermined policy, it follows that peace propaganda and actual peace terms must also do so. And so it came about that after the collapse of Bulgaria in the autumn of 1918 and when it was evident that the end of the war was in sight a gradual evolution of war propaganda to peace terms propaganda took place.

Lord Northcliffe arranged for a general summary of the proposed peace terms to be printed in the *Times* issue of 4th November, 1918, and also had it cabled to every important country in the world. Lord Northcliffe's memorandum was widely published in the German Press, and had the effect of producing a state of mind which contributed materially to the complete collapse of German resistance.

Propagandist Personnel.

Granted that the whole-hearted co-operation of political and military elements are essential to the effectiveness of the scheme, the experience

of the late war tends to show that the pressman is the most suitable mouthpiece for propaganda literature. It has been said of pressmen that they have a feeling for words and moods, and that they know that the public is not convinced by logic but seduced by stories.[1]

It is necessary, however, to draw a sharp distinction between pressmen and newspaper proprietors, particularly if the latter should be members of the government. Lord Northcliffe's appointment as head of the Department of Propaganda met with considerable criticism in Great Britain, until it was announced that he had temporarily resigned all direction of the Northcliffe Press. It is rightly argued that newspaper proprietors, if made members of the government, automatically make the government responsible for articles in the newspapers concerned, and further, that if the Press voices government opinion only, it loses its freedom and authority. It seems, therefore, that the ideal directing personnel should be selected from somewhat less conspicuous material, such as first rate journalists who are not themselves newspaper proprietors.

The Future of Propaganda.

War propaganda *can* be conducted on a basis of high principle and equity. It should, for its own sake, contain nothing but the truth, and, although admittedly a weapon of offence in so far as it is designed to weaken the will of the enemy to resistance, it can nevertheless serve a high purpose in conveying to the recipients a frank statement of the aims of those who originate it.

Propaganda issued and accepted in good faith can do much towards the curtailment and even prevention of war, and, whilst its immediate future in this and other countries may be largely concerned with political factions, there is little doubt but that its value will increase with the advance of civilization and that, should the occasion arise, it will prove a potent factor in any future war.

[1] "Propaganda Technique in the World War." By H. D. Lasswell, p. 32.

AN EARLY EXAMPLE OF PROPAGANDA

A FRENCH ACCOUNT OF TRAFALGAR

FIRST BULLETIN OF THE GRAND NAVAL ARMY[1]

[From *Moniteur.*]

Head Quarters, Cadiz, Oct. 25. [1805].

The operations of the grand naval army second in the Atlantic those of the grand imperial army in Germany. The English fleet is annihilated! Nelson is no more! Indignant at being inactive in port, whilst our brave brethren in arms were gaining laurels in Germany, Admirals Villeneuve and Gravina resolved to put to sea, and give the English battle. They were superior in number, forty five to our thirty three; but what is superiority of numbers to men determined to conquer? Admiral Nelson did every thing to avoid a battle; he attempted to get into the Mediterranean, but we pursued, and come up with him off Trafalgar. The French and Spaniards vied with each other who should first get into action. Admirals Villeneuve and Gravina were both anxious to lay their Ships alongside the Victory, the English Admiral's Ship. Fortune, so constant always to the Emperor, did not favour either of them—the Santissima Trinidada was the fortunate Ship. In vain did the English Admiral try to evade an action; the Spanish Admiral Oliva prevented his escape, and lashed his vessel to the British Admiral. The English Ship was one of 136 guns; the Santissima Trinidada was but a 74. Lord Nelson adopted a new system: afraid of combating us in the old way, in which he knows we have a superiority of skill, as was proved by our victory over Sir Robert Calder, he attempted a new mode of fighting. For a short time they disconcerted us; but what can long disconcert his Imperial Majesty's arms? We fought yard-arm to yard-arm, gun to gun. Three hours did we fight in this manner: the English began to be dismayed—they found it impossible to resist us; but our brave sailors were tired of this slow means of gaining victory; they wished to board; the cry was, "à l'abordage!" Their impetuosity was irresistible. At that moment two Ships, one French and one Spanish, boarded the Temeraire: the English fell back in

[1] As it appeared in the *Herald*; reproduced from the "Naval Chronicle," 1805. Vol. 14. Page 377.

astonishment and affright—we rushed to the flag-staff—struck the colours —and all were so anxious to be the bearer of the intelligence to their own Ship, that they jumped overboard ; and the English Ship, by this unfortunate impetuosity of our brave sailors and their allies, was able, by the assistance of two more Ships that came to her assistance, to make her escape in a sinking state. Meanwhile Nelson still resisted us. It was now who should first board, and have the honour of taking him, French or Spaniard—two Admirals on each side disputed the honour—they boarded his Ship at the same moment—Villeneuve flew to the quarter-deck—with the usual generosity of the French, he carried a brace of pistols in his hands, for he knew the Admiral had lost his arm, and could not use his sword—he offered one to Nelson : they fought, and at the second fire Nelson fell ; he was immediately carried below. Oliva, Gravina and Villeneuve, attended him with the accustomed humanity. Meanwhile, fifteen of the English Ships of the line had struck—four more were obliged to follow their example—another blew up. Our victory was now complete, and we prepared to take possession of our prizes ; but the elements were this time unfavourable to us ; a dreadful storm came on—Gravina made his escape to his own Ship at the beginning of it—the Commander in Chief, Villeneuve, and a Spanish Admiral, were unable, and remained on board the Victory—The storm was long and dreadful ; our Ships being so well manœuvred, rode out the gale ; the English being so much more damaged, were driven ashore, and many of them wrecked. At length, when the gale abated, thirteen sail of the French and Spanish line got safe to Cadiz ; the other twenty have, no doubt, gone to some other port, and will soon be heard of. We shall repair our damages as speedily as possible, go again in pursuit of the enemy, and afford them another proof of our determination to wrest from them the empire of the seas, and to comply with his Imperial Majesty's demand of Ships, Colonies, and Commerce. Our loss was trifling, that of the English was immense. We have, however, to lament the *absence* of Admiral Villeneuve, whose ardour carried him beyond the strict bounds of prudence, and, by compelling him to board the English Admiral's Ship, prevented him from returning to his own. After having acquired so decisive a victory, we wait with impatience the Emperor's order to sail to the enemy's shores, annihilate the rest of his navy, and thus complete the triumphant work we have so brilliantly begun.

THE INFLUENCE OF AIRCRAFT ON SEA POWER

By Commander Sir C. Dennistoun Burney, Bart., C.M.G., R.N.

On Wednesday, 26th March, 1930, at 3 p.m.

Admiral Sir William E. Goodenough, K.C.B., M.V.O.,
in the Chair.

The Chairman, in introducing the Lecturer, said that in the past he had devoted his inventive genius to matters in connection with protection under the sea; he had had a distinguished service on the sea, and was now going to give some of his ideas on matters connected with the firmament over the sea.

LECTURE.

IN attempting to deal with so large a question as the influence of air power upon sea power in the short time at my disposal, I can but treat the subject in bare outline. If, therefore, some of my assertions seem somewhat dogmatic, I would ask you to believe that they have not been arrived at without a careful consideration of the opposing point of view.

WHAT SEA POWER MEANS.

To start with, I think we want to be clear as to what we really mean by sea power; that is necessary before we can discuss the influence that air power may have upon it in the future. Sea power may be defined as the ability to impose our will upon the movement of ships of any character that may be supported by the waters of the ocean. Hitherto the exercise of that ability has necessitated carrying armed forces in some kind of sea-supported vessel. But that has been a matter of expediency. If we had the requisite inventive ability and mechanical skill, the necessary control of water-borne vessels might be undertaken by vessels supported by the air, or perhaps with no vessels at all, but by the utilization of various electrical or other controlled and directed waves. The first point I wish to emphasize, therefore, is that, even assuming the merchandise of the world will always be carried upon the surface of the sea, it is a complete fallacy to suppose that the means for defending or attacking that sea-borne merchandise must also travel upon the sea.

The second important consideration is whether or not conditions may so change as to deprive sea power of its importance, by enabling us to exercise "land power" without regard to what is happening upon

the sea. Because, after all, sea power is but a means to an end. We live on land, not on the sea, and what we really mean by sea power is the effect that the control of the sea may have upon the land.

Hitherto "land power" has been exercised by an army which has had to be transported and fed by sea power. Suppose, however, we had an air fleet so efficient that it could transport and feed an army with all its needs, or if we could devise a poison gas so effective that we could bury the whole area of the enemy country in deadly gases, we should not require sea power in the former case, or either sea power or an army in the latter. The real problem that we have to discuss, then, is of a three-fold character, and it may be stated thus:—

(1) Can we conceive of air power, within a reasonable period, eliminating the utility of sea power altogether?

(2) Provided sea power remains an essential factor in warfare, can aircraft perform the whole of the functions now exercised by water-borne craft?

(3) If aircraft can effect neither of the first two conditions, in what way are they likely to alter our present methods of exercising sea power?

These are, I think, the real questions that must be answered, and in order to keep the discussion within reasonable limits, I will consider them only in relation to Great Britain and the Empire.

AIRCRAFT DEVELOPMENT.

In order that we may have some definite basis for our discussion, I will outline what I think will be the capabilities of aircraft in some ten or fifteen years time.[1] In so doing only the normal evolution of the present day aircraft will be considered. To avoid wearying you with an analysis of technical considerations, I will ask you to accept the conclusions arrived at in my recent book, "The World, the Air and the Future," to which I would refer those interested in these details.

The analysis showed the feasibility of constructing a rigid airship capable of a cruising speed of 90 miles per hour, with the ability to carry a pay load, exclusive of crew and fuel, of 50 tons, and with a range of between 5,000 and 7,000 miles, or at 60 miles per hour, with nearly three times that range.

As regards heavier-than-air craft, the analysis justified the following forecast of immediate developments; a flying boat of between 70 and

[1] It is interesting to compare this forecast with that in the article on "Aircraft in War in Ten Years Time," in the JOURNAL of November, 1929.—EDITOR.

100 tons displacement, capable of a speed of between 130 and 150 miles per hour, with a range in still air of 2,500 miles, and able to carry a pay load of 10 tons; a land machine of some 20 tons displacement with a speed of between 110 and 130 miles per hour and a range of 12,000 miles, and a pay load of 4 tons.

These will be the main long-distance craft, and there will necessarily be variations when special attributes, such as high speed, are required. I will not go into the question of the smaller fighting machines, as it is difficult to foresee the capabilities of this type of craft when the major design consideration is given to one special feature. It suffices to say that speed and range are rising consistently but slowly.

FLYING BOATS OR BATTLESHIPS.

Assuming, then, that aircraft are capable of these performances, the first question we have to consider in order to arrive at some idea of their fighting potentialities is how far their attacking power compares, say, with that of a battleship. Now any type of fighting craft, whether it is a sea-borne vessel or an air-borne vessel, performs its function by transferring from itself to a selected spot on its adversary a certain weight of explosive or poison gas. A battleship does this by firing a projectile weighing over a ton from a mechanical appliance in the form of a gun, which, with its auxiliary machinery and protection, weighs many hundreds of tons. Owing, however, to the method employed, the actual weight of the explosive transferred is seldom more than between 7½ and 10 per cent. of the weight of the projectile, and we may say, therefore, that although we have a battleship weighing perhaps some 35,000 tons to provide the moving platform to carry its guns, the actual transfer of weight of explosive from itself to its adversary is not much more than 50 tons. An aircraft, on the other hand, can utilize the force of gravity instead of having to use a gun, with the result that the proportional weight of explosive in the container is almost in the direct inverse ratio to that used by the battleship; that is to say, the weight of an explosive is more like 90 per cent. and the weight of the container 10 per cent. On this basis, some six flying boats, each having an ability to carry a load of explosives of 10 tons, have the same attacking potentiality as the battleship, weighing some 35,000 tons.

These, I know, are drastic generalizations, and there are many detailed factors which should be given due consideration, but I want to emphasize the striking differences in principle between the sea-borne and the air-borne craft. The deduction which can be made from this is that the equivalent offensive capacity can more easily be carried by air than by sea, and, therefore, where conditions permit, control of sea-borne merchandise must necessarily pass to aircraft; but that

limiting phrase " wherever it can be done," is the determining factor which we have to consider

In practice, each type of aircraft suffers from certain inherent disadvantages which limit its effective power as a fighting machine to a pronounced extent. The main disadvantage of the flying boat, for example, is its inability to remain air-borne for more than some twenty hours, and, therefore, any operation which it has to perform must be completed within that time limit. The airship, on the other hand, though it does not suffer from this particular disadvantage, is generally admitted to be too vulnerable to be of much value from a fighting point of view. Generally speaking, we may say that the aeroplane and flying boat will be used for fighting purposes, and, owing to their limited range, will operate mainly over narrow waters; airships, whose value lies in their great range of action, will be used chiefly for reconnaissance work, and their area of greatest utility will be over the wide ocean spaces.

But assuming that, where conditions allow, the control of sea-borne merchandise will pass to aircraft, let us see how this affects our national and imperial defence problems. At the outset it must strike us that there is a vital difference in character between the defence of Great Britain and the defence of the outer Empire. The whole of Great Britain lies within the radius of attack of large aircraft from Continental countries, and we shall arrive at a truer criterion of the situation if we visualise the ability of aircraft to cruise over any of the vital portions of Great Britain. It would be of little use to protect our sea-borne commerce as it comes within a few hundred miles of our coast, if our docks and factories were destroyed, and if our power stations and railways were incapacitated and unable to assist in the distribution of cargoes arriving in this country. Similarly I venture to question the utility of any form of warship convoy for merchant vessels within the narrow waters, where they will be exposed to attack by aircraft with several times their speed, and with greater destructive potentiality.

We may say then, in so far as Great Britain is concerned, that within the next generation the whole of the defence of these islands will have passed to the air, and that the functions which are now exercised by sea-going craft must necessarily be assumed by aircraft.

On the other hand, when we come to consider the outer Empire and the great ocean spaces, we realize at once that aircraft can have but little effect. Their range is too limited and their endurance too small. I am speaking, of course, of heavier-than-air craft, for, as I have already said, it is the attacking capacity of these craft, and not that of airships, which has to be taken count of in the conduct of naval warfare. For our outer Empire, then, the sea-borne craft is all important.

It will necessarily be assisted in its functions by such aircraft as the vessels themselves can carry, and by local flotillas of flying boats at certain focal points. Nevertheless, the fact remains that outside the narrow waters sea craft will be as important in the future as they have been in the past. It is, therefore, of paramount importance that our organization for defence should have regard to these probabilities, and that there should be no alteration in organization, as each year passes and witnesses a greater transfer of function in the narrow waters from sea craft to air craft.

I would emphasize here that the potentialities which I have given to aircraft are those which seem to be certain. They are not, I think, unduly optimistic, and any unforeseen invention is likely to increase their capacity and not to diminish it. In other words, the capacity of the aircraft which I have quoted is likely to be the minimum rather than the maximum in some twenty years time.

When dealing with preparations for war we have to pay regard to two factors; firstly, the contemporary problem, in which the actual forces which we have at our disposal at any moment are of vital importance; and secondly, the type of organization under which the administration is working, and which must necessarily have regard not only to contemporary issues but to the probabilities of the future. Accordingly, whilst allowing the contemporary issue to have great weight, we require a policy, both in the equipment of our Services and in our type of organization, which is always moving towards what we believe to be the requirements of the future, and we must reject a policy which at a later period of our evolution will have to be scrapped or reversed. This brings us to a more controversial aspect of the subject under discussion: the organization of our defence forces.

CO-ORDINATION OF SEA AND AIR FORCES.

It will be realized at once that there is no clear distinction in function between the sea-going warship and the fighting aircraft. Both are self-contained vehicles capable of transporting offensive weapons, but they are neither of them holding, occupying or garrisoning forces. The Army, on the other hand, is a holding, occupying, and garrisoning force, whose equipment, supply and transport must be provided by one or other of the mobile forces. If, therefore, we follow out the logical process of dichotomy by contradiction, we come to the inevitable conclusion that the Admiralty and the Air Ministry should be combined into one department to supply the Army or holding force with its necessary transport and tactical machines. I know that various politicians have put up strong arguments for an independent Air Force on the plea that the Air Force is able to garrison such places as Iraq

and Egypt at much less cost than the Army by itself. It seems to me that this is equivalent to wishing that the Army Service Corps should be in supreme command of the Army, and should garrison and police all parts of the Empire. Actually, garrison and police work is carried out by the Army, or by ground troops attached to the Air Force, and aircraft are merely used as transport vehicles for the political administrator, and the various garrison or police troops.

More important, however, than any police duties throughout the Empire, must be the protection of our country, the centre of the Empire, and the safety of sea-borne commerce, without which we could not live; and it is these two latter considerations which call, and in my opinion will call more strongly as each year passes, for the co-ordination and combination of our two mobile defence forces.

Our present organization, under which the forces are kept separate, is both wasteful and unpractical, and its continuance may well lead to a situation which borders on the absurd. For example, consider the position of heavier-than-air craft in any future war. These craft, and flying boats in particular, will do the long-distance bombing. But their function will be twofold. One will be to attack the enemy fleet, the other will be to attack towns and encampments as far as five hundred miles inland. In the latter operations they may or may not be acting in conjunction with the Army. But who is to be their competent authority? The Admiralty, the War Office or an independent Air Ministry? To whom, for example, are flying boats to look for orders, once they have left the waters on a concerted land and sea operation. A sudden change of plan may be necessary; who is to be responsible for issuing new orders by means of wireless communications? Seeing that these craft operate from the water, that their bases are water bases, and that they will have to return to these bases at frequent intervals for repairs, refuelling and remunitioning, does it not seem the obvious thing to regard them as an integral part of the fleet, instead of inviting all the confusion and disaster that arises from a divided command.

Thus, whether or no we like the idea of unifying the two Services and placing them under one Department, we cannot get away from the fact that a drastic reorganization of our present system on these lines is essential if we are to secure the close combination of naval strength and air strength, on which all effective use of sea power in the future must be based.

BASES.

We have seen that the defence of these islands must rapidly pass to the air, but the defence of the Empire will continue to be primarily a naval problem. A natural corollary to this development is that the

bases which we require in this country are aerial rather than naval. Again, as the centre of our naval activity shifts from home waters to the outer Empire, we shall have to redistribute our naval bases accordingly. Thus, as time goes on, we shall want very few naval bases in this country—eventually one will be enough—but we shall want more and more in different parts of the Empire. Yet, in spite of these obvious facts, a large part of the Admiralty vote still goes to the upkeep of such out-of-date dockyards as Chatham and Sheerness, and at the same time we have the strenuous political opposition to the development of a naval base at Singapore. All of which clearly shows that our authorities have not yet come to grips with the issues of the new orientation.

Our policy in regard to dockyards in recent years is instructive. For example, in 1924, as compared with 1904, we were actually spending twice as much money on dockyard accommodation for two-thirds of the number of ships. In 1924 we had only forty large vessels in commission as compared with sixty-six in 1904, yet our dockyard expenditure was £7,000,000, as compared with £3,000,000 in that year. Even allowing for the difference in purchasing value of the pound sterling, these figures show an increased expenditure on home dockyards which cannot be justified by any sound reasons of naval finance. These dockyards should, as far as possible, be converted into commercial ports. Chatham, for example, could be made an extension of the Port of London Authority. The money saved on these dockyards could be spent partly on developing the Naval Air Arm or in building aerial bases at home, and partly in building naval bases at vital points in the Empire, in conjunction with the Dominions, who would bear part of the expense of the latter.

The question now arises—in what part of the Empire are these new bases most urgently required? The answer is clear. We shall require them most of all in the Pacific Ocean, for there seems little doubt that the focus of naval power is now situated there, and in any future world war that ocean and its adjacent seas would be the centre of big naval operations. From the naval point of view, therefore, the building of the Singapore base is unquestionably a move in the right direction.

Now the fact that Great Britain will have to concentrate her greatest naval strength in the Pacific has important implications that have a close bearing on the subject of this lecture; it means that she will have to supervise and patrol three times the water surface that she had formerly to supervise and patrol in the Atlantic, the North Sea and the Mediterranean. Consequently, if Great Britain is to maintain a sea strength adequate to the requirements of Imperial Defence, her Navy must be greater than ever before; not because other navies are bigger,

but because other navies of the same size as before are operating over a much bigger area, and, therefore, the number of auxiliary vessels and cruisers required by our Navy must be necessarily greater in proportion.

But we cannot increase the size of the Navy. Quite apart from the limitation imposed on us by our international agreements, we simply cannot afford to build and keep up a bigger Navy. The only solution is for the Navy to look to air power to assist it. It will be found that all those duties of patrol, reconnaissance, long-distance scouting and so forth which the Navy has to carry out on the great ocean spaces, can be performed more effectively and at a much lower cost by aircraft than by surface vessels of any kind.

This brings us back once more to the actual uses of aircraft in naval warfare. As regards heavier-than-air craft, I have already pointed out their superior attacking power as compared with that of the battleship, in narrow waters and for short range work generally; at the same time, I emphasized the limited conditions of their use owing to their lack of endurance and carrying power. For use over the wide ocean spaces, it is to the airship, rather than to the aeroplane or flying boat, that the Navy must look for assistance.

AIRSHIPS FOR NAVAL DUTIES.

Broadly speaking, the belligerent functions of the airship are strategic rather than tactical. As has already been remarked, the airship is of little use as a fighting machine; she offers a big target to the enemy, and her structure is decidedly vulnerable; nor has she the speed or elasticity of movement which enables an aeroplane to escape quickly out of the zone of fire. But though she may be almost negligible as a combatant vessel, the airship will be invaluable as a naval scout, and as such her development is of considerable importance to Great Britain. For it will be found on examination that all those duties of patrol, reconnaissance, and long-distance scouting which the Navy has to carry out on the wide ocean spaces—now to a greater degree than ever before—can be more efficiently performed, and at far less cost, by airship than by light cruisers or any other kind of surface vessel. It is, therefore, as "the eyes of the fleet" that we can best define the functions of airships in the sphere of naval strategy.

Admittedly, the disadvantages under which airships at present operate, owing to their dependence upon mooring masts and their inability to leave their sheds in all weathers, have militated against their use by the Navy. It must be borne in mind, however, that the airship is becoming more efficient with every new construction, and that as development proceeds, most of the difficulties which now attend their operation will be overcome. It is well to remember this in estimating their probable value as naval craft in the near future.

As a scout vessel the airship has four great advantages over the cruiser :—

(1) She is two or three times as fast, and owing to the height at which she travels, her range of visibility in clear weather is very much greater ;

(2) Her radius of action is vastly greater. For example, " R.100," which has a displacement of 5,000,000 cubic feet, would, if the passenger quarters were eliminated, have a still air radius of over 7,000 miles at 60 miles an hour ; and it has been estimated that an airship of 10,000,000 cubic feet, carrying fuel in the place of passengers and cargo, would have a still air radius of about 12,000 miles at 60 knots.

(3) The airship, unlike the cruiser, is invulnerable to mines and torpedoes, and has little to fear from submarines.

(4) The economic argument is overwhelmingly in favour of the airship. It has been estimated that the cost of patrolling and searching out an area of 1,000 square miles of ocean by airships will only amount to about 25/-, whereas the cost of patrolling the same area by cruisers would be £77 10s. These are only running costs, including fuel and crew, and take no account of depreciation, repairs, upkeep, bases, insurance, etc. If capital costs are considered, it is found that for an outlay of £3,500,000 airships can provide a power of reconnaissance and patrol which can only be obtained from cruisers at a cost of £55,000,000, while the saving in annual upkeep by using airships instead of cruisers would amount to £11,000,000.

Now it is common knowledge that Great Britain's cruiser programme is not nearly adequate to the needs of her great maritime Empire. Forty or fifty cruisers cannot possibly hope to patrol all the seas of the world, and to protect 80,000 miles of trade routes ; yet if, in any war, our trade routes were closed to us, it would mean the starvation of our people and the speedy collapse of the whole imperial fabric. Since, however, each cruiser costs about £2,000,000, the laying down of a cruiser programme that can be regarded as really adequate to our naval requirements is no longer a practical proposition. There is also the decisive fact, to which I have already alluded, that the progress of naval disarmament does not allow of our extending our cruiser programme, even if we had the money to do so. There are no restrictions, however, in regard to the building of airships. In default, therefore, of the requisite number of cruisers, our naval authorities will, I suggest, be compelled in the interests of the national safety to look to airships to make up the deficiency.

Yet again, there can be no question of the airship superseding the cruiser altogether. We shall always need as many cruisers as we can afford, or are allowed to build. But the cruiser has two functions: one is to fight enemy warships, and the other is to patrol, survey and obtain information; and the airship will be able to relieve it of a great part of the latter function. And as this transference of duties from the cruiser to the airship will make both for efficiency and economy, and at the same time enable us to solve one of the most urgent of our naval problems, it is to be hoped that the Admiralty will grapple boldly with the situation and take a forward line in the development of airships.

CONCLUSIONS.

And now to sum up the conclusions we have reached. I said at the beginning of my lecture that the problem of the effect of air power on sea power involved a question of a threefold character. Firstly, can we conceive of air power within a reasonable period of time eliminating the utility of the exercise of sea power altogether? Secondly, provided that sea power remains an essential factor in warfare, can aircraft perform the whole of the functions now exercised by water-borne craft? Thirdly, if aircraft can effect neither of the first two conditions, in what way are they likely to alter our present methods of exercising sea power?

The result of our enquiry has shown that only the third question involves issues of practical importance. There are no signs at present that air power will ever be able to supersede sea power altogether. And, short of some marvellous development in aeronautical science, which our present technical knowledge by no means justifies us in anticipating, it would seem equally clear that in naval warfare aircraft will not be able to perform the whole of the functions now exercised by water-borne craft for many a long year to come, if ever.

This being so, we, in Great Britain, have to solve the problem of the relation between air power and sea power from the point of view of preserving the natural advantages given to us by our sea centrality; so that for us air defence and sea defence are really two aspects of one and the same problem. In other words, the advent of aircraft has not diminished the importance of sea power to Great Britain, it has merely effected a change in the means and methods she must use if she wishes to maintain her maritime strength. In fact, air power has not destroyed the utility of navies at all; what it has done is to force into being a new type of navy of which aircraft will be an indispensable part.

The problem for Great Britain, therefore, resolves itself into two main issues. Firstly, how to utilize air power as a means of support in the exercise of our sea power; and secondly, how far will the

utilization of aircraft for naval functions necessitate a new orientation of our naval policy?

These questions I have tried to answer, and since, henceforward, naval power means an amalgamation of sea power and air power, I have laid special stress on the importance of bringing the Navy and the Air Force under unified control. For we must have a Navy made up of a surface fleet and an air fleet, each the strategic and tactical complement of the other, and the two forming together a single fighting organization. In this way, and in this way only, can British sea power successfully meet the challenge from the air.

DISCUSSION.

The Limitations of Aircraft.

Rear-Admiral W. Tomkinson: The lecturer prophesied that in about fifteen years time flying boats will have reached a displacement of 70 to 100 tons. I should like to ask him what is his definition of displacement with regard to flying boats.

In comparing the amount of explosive which flying boats can drop with the amount of explosive transferred by a ship's guns, he gave certain figures, but said that he could not go into the matter deeply because there were a good many things involved. With that I agree, and I do not think any figures are of the slightest use unless we can go into the whole thing and give the rate of hitting per minute. The mere dropping of explosives on to a target is not everything; other factors have to be taken into account, and anyone who has seen the effect of firing even practice projectiles with no explosive in them, at a ship will, I feel sure, agree with me.

The lecturer anticipates the control of the sea in narrow waters being transferred entirely to the air; but I suggest that the control of the sea is not merely a matter of dropping bombs on ships; it embraces many other things. Aircraft can do practically nothing at night, and, unless they resort to barbaric forms of warfare, they cannot stop merchant ships; moreover, they are incapable of boarding ships, the examination of which is a very important part of the control of the sea. Again, if these aircraft are going to attain such large proportions, it must be presumed that they will be immense targets, and the methods of hitting these aerial targets are not going to stand still during the next fifteen years. They have made enormous strides, even within the last few years; indeed it is possible that much greater improvement has been made in this respect than in the aircraft themselves. With targets of 70 to 100 tons in the air, the anti-aircraft weapons should have a good time.

With regard to the use of airships for patrolling, I think everyone has seen great possibilities in that, but when the airship has found something, what is she going to do next? A cruiser on an ocean patrol is continually boarding ships; an airship cannot do that, so presumably she can only report and endeavour to bring up something else to do it.

I am afraid my remarks have been very critical, but I should like to add that I agree very much with the lecturer's views as to the enormous possibilities of a real combination of air power and sea power. I am quite sure that at the present moment a great many people do not realize those possibilities, and I hope that within the next few years that combination is going to be very much improved.

The Air Defence of Shipping.

Air Vice-Marshal Sir Vyell Vyvyan: I agree that the protection of commerce in narrow waters is likely to pass to the air. The previous speaker used the phrase, "unless they resort to barbaric action"; but I am afraid everyone will continue to do that in war. I cannot myself conceive, knowing the French power in the air, that it would be possible, in the event of war with that country, for merchant ships of any sort to pass up the Channel. Again, when he said that aircraft could not work at night, he was making a very great mistake. I agree with the lecturer that it is time this subject with regard to the defence of narrow waters was studied, as it may be found that the defence must be mainly an aerial one. When it comes to more distant seas, like the Mediterranean, it is another matter.

Co-ordination of the Forces Controlling the Seas.

Vice-Admiral W. H. D. Boyle: Personally, I agree with very much that the lecturer has said, and I think it is high time that the two Services drew much closer together. In fact, they are beginning to do so every day. Anyone who was in the Services ten years ago realises that. No Admiral now feels himself properly equipped unless he has aircraft under his orders. Every cruiser squadron should have a small aircraft carrier. It is quite hopeless for squadrons to do their work unless they have air assistance, that is if they are pitted against other squadrons which have that advantage.

With regard to the airship patrol of the Pacific, I have always understood that airships wanted a very large base and careful preparations for housing. In the Pacific they would have to fly over very long distances from the focal points to get to any sort of base where they could be refuelled and have done to them whatever was necessary. The Air Force at and over the sea and the Navy are absolutely inter-dependent. If it is said that the one absorbs the other, that does not matter, it is only a manner of speaking. Possibly it would be best to find an altogether new name for the combination. In fifteen years time let us hope we shall see the air forces and the naval forces controlling the seas so connected together that they will be practically one Service and under one Head.

THE LECTURER.

The Lecturer: In reply to Admiral Tomkinson, the displacement of the flying boat is taken as the total loaded weight which that craft will lift into the air. It is the same as the sea displacement if she were floating in the water.

With regard to the question of the rate of hitting per minute, my whole object in bringing out the difference between the amount of paraphernalia required in a sea-going ship to transfer its explosive from itself to the enemy, as compared with what was required in this respect by an aircraft, was to emphasize the difference in principle. I quite admit that I intentionally overdrew the analogy in order to bring it out. To obtain an exact comparison of what the two could do would require a very exhaustive analysis.

I cannot agree with Admiral Tomkinson that the control of the sea cannot be obtained by attacking merchant vessels and other ships with bombs. It is the admitted policy of this country in aerial warfare to bomb towns, with the result that the civil population will be injured; the whole object of the bombing being reprisals on the enemy. I cannot conceive any argument whereby it can be urged that civilian lives and property should be safe on the sea, although liable to be

bombed out of existence on the land. I do not believe it for one moment, and I venture to think that the first action taken by a belligerent power would be to proclaim a blockade which would extend to within 400 or 500 miles of the coast, and to say that any merchant ship and, of course, any warship, of the enemy entering that blockaded area would be sunk at sight. I think that is bound to happen.

With regard to the size of the aeroplane as a target and their tendency to increase in size, I venture to think that the cloud effect is usually forgotten. It is perfectly possible to be flying in cloud and to remain in cloud until vertically over the target, and then dive at it. I do not think that any form of anti-aircraft gun is likely to affect the result. In the United States I understand recent exercises have been carried out in which diving has taken place from 17,000 feet with air bombs, and the result has been something like 80 per cent. of hits.

With regard to Admiral Boyle's point as to what airships are to do when searching and patrolling the ocean for enemy vessels, and the question of bases in the Pacific, we are making a development now which I think will have a considerable bearing on those matters. We are designing an airship to alight and take off from water in exactly the same way as a flying boat, and that will be able to operate from a floating base. It will make fast to a floating tender, and yet remain stable on the water, and swing to the wind. I see no difficulty in a merchant ship being converted into an airship base-supply ship, and accompanying either a cruiser squadron or a fleet. I would remind you that during last year "R.101" was at the mooring mast in the worst gales we have experienced in this country for several years, and rode them out perfectly satisfactorily. We have now got to a point in which airships can operate in practically any weather, and I do not think it will be many years before the facilities for moving airships in and out of their sheds and operating them will be so perfected as to make them absolutely reliable. So far as their vulnerability is concerned, so long as they are operated on hydrogen they must, of course, be vulnerable.

THE CHAIRMAN.

It is not necessary, generally speaking, for a Chairman to express entire agreement with a lecturer. I should be quite prepared to disagree with a good many things which my brother officer has said, and I am sure that he would enjoy listening to our criticisms as much as we have all enjoyed listening to him; but I congratulate him on giving us a most suggestive lecture.

With regard to air defence of narrow seas—the Mediterranean was mentioned—I think that it will be many years before we shall be ready for control to be left entirely to aircraft there. I find it very difficult to subscribe entirely to the view that aircraft of any kind can take the place of a light cruiser, but I quite admit that I may be prejudiced in that direction. The weather still has an immense effect, and although we have just heard of an airship which will ride out a heavy gale, still, I do not think that the moment has yet come, nor to my mind will it come, when the light cruiser can be done away with in favour of the airship. I hasten to say, of course, that the lecturer did not propose that.

I confess that I do not understand how one can qualify the term "warfare" by any other word, whether "barbaric" or "humane."

I agree with what has been said as to the necessity for the closest possible co-operation between the two very mobile forces, one on the sea and one in the air, which make up our particular form of defence.

The customary votes of thanks to the Lecturer and Chairman were carried by acclamation.

AIRCRAFT CARRIERS OR FLYING BOATS

By COMMANDER G. C. E. HAMPDEN, R.N.

IT is probable that no one would welcome the abolition of aircraft carriers more than the Commanders-in-chief of large fleets, provided that a satisfactory service of aircraft could be maintained in some other way. These ships are like baskets containing so many valuable eggs that an enemy must seek to destroy them, and so they constitute a greater source of anxiety than any other unit in the fleet. Moreover, they are less able to defend themselves than any other type of warship, and, therefore, forces which may be urgently needed elsewhere must be detailed to protect them.

Nevertheless, aircraft are essential to modern fleets, and must be available to operate at short notice in almost any weather, both in daylight and darkness. Any alternative to the carrier, therefore, must be able to fulfil these requirements. Three possible alternatives present themselves, namely :—

(1) Airship carriers.
(2) Large flying boats.
(3) The adaption of fighting ships to carry all their own aircraft.

Theoretically, the airship carrier is ideal, but practically it has many drawbacks. It is vulnerable both as regards weather and attack, and, in the present state of its development, it cannot carry sufficient aeroplanes or afford adequate facilities for their repair and upkeep. Its exponents might claim in its defence that it has the power to return to a shore base quickly to replace a damaged cargo with a fresh one, but such a claim would be unsound, for it would entail many expensive and well defended bases, and, even then, in the event of a naval action in distant waters, the journey to and from any possible base might take so long that the fleet would be without aircraft at the critical time.

Thus, for practical purposes, the choice lies between the self-supporting flying boat and the aeroplane carried in some form of surface ship.

Now it is well known, of course, that no unit can be regarded as efficient for duty with a fleet unless it can keep the sea, and work with

the fleet under ordinary ocean weather conditions. Both submarines and destroyers have increased greatly in size in order to meet these requirements, and judged by present day standards no craft of under a thousand tons appears to be large enough to satisfy them. This implies that before the flying boat can become sufficiently seaworthy when on the surface, it must be very much larger than it is to-day, and until it can do so it cannot supersede ship-borne aircraft as a unit of the fleet. Meanwhile, visions of what flying boats will be like in the future are useless; facts and not fancies are the only things that count in a matter of this kind. It is a fact, for instance, that no flying boat exists that can alight on or take off from the sea in safety under all weather conditions in which surface ships could fight. It is also a fact that there are many ocean areas traversed by ships in which fighting might occur that are thousands of miles from any possible naval or aircraft base or even from land. The arguments against the airship carrier and its dependence on a base apply equally, therefore, to the flying boat when it comes to working with men-o'-war. Unless she can alight and replenish, or remain in the air for, say, three weeks without losing her efficiency or wearing out her crew, she must return to a base frequently, and, during her absence, the fleet is denuded of its air services. This does not mean that flying boats are of no use to a fleet, but only that in the present state of their development they cannot be relied on as its only air units.

The duties of fleet aircraft are many, and include reconnaissance, observation of gunfire, torpedo and bomb attack, and defence against hostile aircraft. Apart from other disabilities, large flying boats are not able to perform all these functions efficiently; curiously enough, they are even unsuitable for reconnaissance in some cases. Each of these duties, if it is to be carried out properly, necessitates a personal contact between the aircraft personnel and that in the ships. W/T communication alone is insufficient, and it may break down, quite apart from the importance of reducing its volume as much as possible. Again, bombs and torpedoes require replenishing at short notice if any advantage that may have been gained is to be pressed home. In all cases final verbal instructions given just previous to setting out are often of much greater value than the longest of coded signals.

Before a fleet aeroplane, and especially a reconnaissance machine, leaves a carrier, an important duty of the Observer is to make a close study of the "plot," and to acquaint himself with all the latest information regarding his own fleet and that of the enemy, as well as what is known of aircraft in the air. He should also visit the Direction Finding office, if there is time, at the very last moment. None of these facilities would be available to the flying boat working independently of a carrier.

The Observer must also procure the latest meteorological reports, including the force and direction of the wind at the height at which he expects to fly. Without these, not only will his navigation be at fault, but also the signalled positions he will give of the enemy. In some cases it may be necessary to instruct him to keep W/T silence, even if he sights the enemy, and to come straight back and report verbally. This has been practised with success on at least one occasion during peace operations, when it was undesirable that the enemy should know that a machine was in the air. This is another objection to the use of large flying boats for reconnaissance, and one which assumes even greater importance at night, when information may be required about enemy movements previous to a proposed torpedo attack. It is true that visual signalling might be employed by a flying boat under such circumstances, but apart from the danger of showing a light, it can never equal the efficiency of the spoken word.

A constant and personal intercourse between the crews of fleet aircraft detailed for spotting and the gunnery officers of the ships with which they work, becomes increasingly desirable as time goes on. The ideal is attained when they are all members of the same mess, and thus see each other constantly. This is well understood by all those who are intimately connected with fleet gunnery work, but seldom by others.

Every effort is made during the training of Observers to provide them with a thorough knowledge of the gunnery organization of each class of ship that they may be called upon to spot for. They are employed also, when not flying, on ordinary ships duties, in order that they may keep up to date. Before any important firing they must be in constant touch with the Control Officers concerned. This is all done with a view to making the Control Officers and their Observers, as much as possible, " one." But, however successful these efforts, it is generally admitted that if the principal Control Officer of a ship could be spared during an action he should be in the air. This being so, it is obvious that efficiency must suffer if strange Observers carry out spotting duties in machines that have flown from some distant base, as would be the case if large flying boats took the place of aircraft carried in ships.

As regards offensive operations by aircraft, it is more than ever important that they should take their departure from surface ships. Their role in a fleet action is not merely that of causing promiscuous damage by torpedo or bomb, but rather to inflict blows from the air as part of the tactical offensive of the fleet as a whole. Such co-operation can only be ensured by last minute instructions. Once again, it may be argued, signals could be made to a flight of flying boats even if it has only arrived recently from a shore base some hundreds of miles away.

But when they have made their attack they must return to the base for another load of bombs or torpedoes before they can follow it up, whilst the ship-carried aeroplanes, with their rapid loading facilities on deck, could be making several attacks. Apart from this it is questionable whether the effective load carried by long distance machines will ever be as great in proportion as that in short distance machines flown off a deck.

To use large flying boats for repelling hostile aerial attacks on ships would be like employing a battleship to do the work of a destroyer. It would also mean a multiplication of the already excessive number of signals. All the information regarding enemy aircraft movements, which are obtained by ships in the ordinary course of events by means of their many W/T sets, D/F, attached aircraft, and " plots," would have to be passed on to the flying boats. This is not necessary when carriers are used, for they are self-contained units.

Many other arguments might be used against abolishing aircraft carriers in favour of flying boats. For example, unless the latter become large enough to alight and take off from the sea under all weather conditions, they are unable to rest their engines or conserve their fuel. The fact that they work from shore bases is not likely to escape the notice of the enemy, and in practice it would simplify his problems. Aircraft carriers, or the ships that carry aircraft, are mobile bases with ready-made defences, and they must be found before they can be attacked. A shore base, however, cannot be moved, and will require defences that would be more expensive than carriers to maintain. Enemy aircraft would only need to watch the aerial " bolt holes " from such bases, and this would be a far more simple matter than maintaining accurate information about several carriers dotted over the ocean. In certain cases temporary outlying bases for refuelling might be formed, but this would afford no argument in favour of the shore base policy, which, unless it can be employed anywhere in the world, must inevitably fail, for the Navy is not parochial, and all its units must be able to fight anywhere.

Signs are not wanting that great battles between fleets will disappear in future wars, and that engagements will mostly take the form of cruiser actions on the lines of communications. This raises another objection to the use of large flying boats. If a small cruiser force is operating, say, six hundred miles from land, and requires one flight of flying boats in constant company, it would mean, after making due allowance for reliefs, at least two flights being allocated to this duty alone : an expenditure of force which violates the first principles of war. Even so, the arrangement would involve excessive and undesirable use of W/T signalling and the grave danger that relief machines would

fail to find the ships. These objections apply, of course, to all cases where aircraft from shore bases have to work with a fleet at sea. On the other hand, it is perfectly useless to contend that a flight of flying boats can remain in company with a fleet for as long as the ships can remain at sea. Even if the fuel question could be overcome there is still that of the engines ; these being of the reciprocating type cannot be expected to run without repairs for as long as ships turbines.

There seems, therefore, to be no effective alternative to the aircraft carrier or to carrying fleet aircraft in surface ships. Submarine carriers hardly call for consideration for reasons that are obvious. There is a hope however, that the carrier in its present form will pass away. Naval Treaties are the fashion, and have as their object the saving (on paper) of expenditure. The Navy is cut down, but the Air estimates are increased, because, to the uninitiated, aircraft appear cheaper, and it is easy to prove that the Air Force is below strength. The experience of the past seems to be forgotten, and restrictions are placed on the fitting of flying decks to ships other than aireraft carriers ; yet this is both the solution indicated by history and the best means of saving expense. To make it possible, many existing ideas on the subject of warship design and fighting tactics may have to be modified. The records of naval construction show a long tale of how each new weapon as it appeared has been added to the armament of warships. On each occasion vast changes in design have been necessary, but, in spite of many difficulties, a steady increase in fighting value has resulted. New materials and weapons invariably change fighting tactics, so there is no reason to suppose that, if aircraft were included amongst the armament of every warship, tactics would not be able to conform to yet another new factor.

Unlike airships, the heavier-than-air machine is only a projectile that is maintained in the air by propulsive force. It may, therefore, be regarded in the same light as the gun or torpedo. It is true that it differs from them in that it must be given facilities whereby it can return, like a boomerang, but it is exactly for this reason that its inclusion as part of the armament of ships becomes so desirable.

As already stated, the 100 per cent. aircraft carrier is exceedingly defenceless, and can easily be rendered ineffective by a few small but well placed bombs or shells on her flying deck. The fact that she must turn into the wind before landing her machines is another drawback. As in the case of flying boats, although to a lesser degree, the crews of her aircraft suffer from being separated from those with whom they must work in the fighting ships. In fact, there is little to recommend her, while everything is in favour of making all other ships do her work,

and thus make each of them into a self-contained unit. If this were done it would finally bury an idea which is as unpractical as trying to mix oil with water, that of employing present-day flying boats to operate from a shore base with a fleet.

The idea of a battleship with an armoured flying deck, combined with the necessity for turning into the wind every time an aeroplane wanted to land on, might well upset present day conceptions of tactics and gunnery, but not to the extent that might at first appear. The proposal to adapt warships to be their own aircraft carriers is, of course, not new, and has already been considered and discarded, but as the fuel endurance of aeroplanes increases it gradually becomes more practical. The machines would be catapulted off in order to save turning into the wind as much as possible. Supposing ten aeroplanes were carried in each battleship, and assuming that an action would not last longer than six hours without a lull, it would not be necessary to turn into the wind very often, for already many types of machines can remain in the air for seven hours.

Either this must happen, or aircraft carriers will become more and more fighting ships. It matters little which of these policies is adopted for both aim at the same result, namely, the employment of aircraft as projectiles that can be fired from ships, rather than as separate units to co-operate with the fleet.

What may happen in the future cannot be foretold. The idea of using flying boats for the fleet's air services catches the imagination of many who do not appreciate the practical requirements and conditions, but the fact remains that apart from those limitations already mentioned, no aircraft of this type can remain in the air for even a hundred hours and carry, in addition to the necessary fuel, a military load of five tons. Even if they did, their performance would not be sufficient to satisfy naval requirements.

A CENSUS OF REGIMENTAL COLOURS

WITH reference to the article which appeared in the May JOURNAL and the proposals of Captain Bullock for a Census of Regimental Colours, it has been arranged to compile such a Census at this Institution. It is intended that the Census shall include Colours of all Branches of His Majesty's land Forces, namely Regular Troops, Militia, Yeomanry, Territorial Force or Army, as well as all Fencible and Volunteer Formations of the past. It is also desired to include Infantry Colours, Cavalry Standards and Guidons, as well as Trumpet and Pipe Banners.

The success of this project must depend on the co-operation of voluntary supporters. Members and others interested are asked to volunteer as representatives, either of a particular regimental unit, or of a district or area.

On being registered these representatives will receive a supply of cards stating the exact particulars which they are asked to fill in. When completed, the cards should be returned to the Secretary of the Royal United Service Institution, with the envelope marked " Colours " in the top left-hand corner. They will then be filed until sufficient information has been collected to warrant further utilization.

The ultimate object is to publish the Census in volume form, but this again must depend on the requisite financial support being forthcoming.

It is particularly desirable that, whenever possible, cards should be accompanied by a good photograph of the Colour or Standard, as it exists to-day. To be of value this must show the Colour extended and not hanging in folds.

The following have already been good enough to volunteer their services :

	Regiment or District.
Captain H. Bullock, F.R.Hist.S.	Indian Army.
Colonel E. L. Hughes, D.S.O., O.B.E.	Northampton Regiment.
Lieut.-Colonel H. de Watteville, C.B.E.	Buckinghamshire.
Major C. ffoulkes	Colours, etc., in the Tower of London.

	Regiment or District.
Lieut.-Colonel R. B. Crosse ..	43rd and 52nd L.I.
Captain H. M. McCance ..	The Royal Scots.
Captain E. H. Campbell ..	Hampshire.
Captain R. M. Grazebrook ..	Gloucestershire.
Captain William Thomas ..	The Leicestershire Regiment.
Lieutenant P. L. Binns	The East Yorkshire Regiment.
Captain T. J. Edwards	General Assistance.

SPECIMEN OF CENSUS CARD.

CENSUS OF REGIMENTAL COLOURS AND STANDARDS.

REGIMENT (Present designation or designation at time of disbandment).

COLOUR OR STANDARD.

(*a*) King's Colour or Regimental Colour, etc.
(*b*) Designation as inscribed on Colour.
(*c*) Dimensions.

PRESENT LOCATION.

(*a*) Place, including building.
(*b*) Ownership.
(*c*) Custody.

Further particulars, including present condition, should be written on the back.

Note.—Whenever possible a photograph should be sent with this card

THE ROYAL UNITED SE
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NITED SERVICE MUSEUM
IN THE
HALL WHITEHALL

Centenary

OF THE

Royal United Service Institution

25th June, 1931

PRELIMINARY NOTICE

The Royal United Service Institution was founded on the 25th June, 1831, at a meeting of distinguished and representative naval and military officers, which took place at the Thatched House Tavern, St. James Street.

The resolution, passed at that meeting, ran as follows:—"His Majesty [King William IV] having graciously condescended to patronize the proposed Institution that it be now formed and designated 'The Naval and Military Library and Museum.'" His Grace the Duke of Wellington was elected as Vice-Patron.

Although the name was changed several times before the grant of the Royal Charter in 1860, when the present title was bestowed, the general aims, work and Service associations of the Institution have been continuous since its foundation.

CELEBRATION.

The Council have decided that the Centenary of the foundation of the Institution shall be celebrated on Thursday, 25th June, 1931, or on some convenient day near that date.

Thay have appointed a Special Committee consisting of four Members of the Council and four Members not on the Council, with the Chairman and Vice-Chairman as *ex-officio* Members, to initiate proposals for suitably commemorating the event.

In formulating provisional proposals, the Centenary Committee have been impressed with the desirability that the celebration should include some scheme with which *all* Members, no matter where they may be, can be associated. They have therefore agreed to open a special fund to be known as the Centenary Fund, which will be devoted to some object or objects of lasting benefit to the Institution or Museum. Further details will be published at a later date, but the nature of this project must necessarily depend on the response made to this proposal.

It has been decided to open the Fund forthwith. Donations, however small, will be most welcome. Cheques should be made payable to "The Royal United Service Institution" and crossed "A/c. of Centenary Fund."

THE PIPERS OF THE BRITISH ARMY

By J. Paine.

" Our loud sounding pipe has the true martial strain
So do we the old Scottish valour retain."—

The Garb of Old Gaul.

In addressing readers of this Journal on the subject of our soldier pipers it is scarcely necessary to begin by stating that these military musicians have, since the days of the Crimean War, been regarded by our Army authorities as an indispensable part of all Scottish regiments. Their daily duties in all these units are similar, their uniforms are with a few minor differences the same, but each regiment cherishes some special boast in regard to its pipers. It is the survival of these little known but much prized distinctions that invests the Scottish piper with an interest of his own. Nevertheless it must not be forgotten that pipers exist, or have existed, in many other than Scottish regiments; nor are they confined to regular units. Pipers form part of regular Irish regiments. They have been introduced into the Indian Army. They exist in the Dominion Forces in Canada, South Africa, Australia and New Zealand. They have always figured in certain regiments of our Militia, Volunteers, Territorial Force and Army. They have lately been instituted in units of the new Army of the Irish Free State. They even form part of our police bands, while they can be met with in many other bands that have assumed the designation of " military." It is not, however, our intention to recount the story of pipe bands as a whole, but only to give a few of those details that are, so to speak, the essence of the pipe bands of our Regular Forces at home and in India.

To Londoners the piper of The Guards needs no introduction. The skirl of his pipes heralds the approach of the Bank of England Guard when this duty is undertaken by the Scots or Irish Guards, and his presence with other musicians often intensifies the fascination of that picturesque ceremony of the Changing of the Guard. It is a proud boast of the pipe band of the Scots Guards, the senior Scots regiment of the British infantry, that it has produced one of the most expert bagpipe players of the age, William Ross, late Pipe-Major of the 2nd Battalion, who for four successive years held the coveted title of Champion All-round Piper of Scotland, and is now Instructor at the School for Army Pipers at Edinburgh Castle.

The Scots Guards' pipers, like those of the King's Own Scottish Borderers, are clad in blue doublets, a contrast to pipers of Highland regiments, who wear of course the familiar green doublet. They differ again from those regiments in that their pipe banners, just as those of the K.O.S.B., are not adorned with officers' family armorials. The black feather bonnet with its becoming tails and red and blue hackle was adopted for full dress by the pipers of the Scots Guards not very many years ago. The pipers of the Black Watch, alone among the pipers of the Line, also wear the feather bonnet. The headdress of other Scottish pipers is, of course, the glengarry, while Irish pipers wear what most closely resembles a Kilmarnock bonnet. The pipers of the Scots Guards, together with those of the K.O.S.B. and of the Black Watch, enjoy the further distinction of wearing the showy red Royal Stewart tartan kilt. The dirk is the arm of all pipers, but at a review order parade the pipers of the Scots Guards carry the claymore as well. The bagpipe in Scottish Line regiments takes the place of the fife of English regiments, but the Scots Guards still retain the drums and fifes, in spite of the pipe band borne on the establishment of each battalion.

The only regular Scottish regiment which does not possess pipes is the solitary Scottish cavalry regiment, the Scots Greys, 2nd Dragoons. But the pipes are essentially a musical instrument that is suited to infantry; they would certainly be out of place if played on horseback.

An additional item worthy of record concerning the pipers of the Scots Guards is that the present Piper to the King, Pipe-Major Henry Forsyth, is an old Guards' piper, whereas Queen Victoria's choice had been that of a Pipe-Major of the Black Watch. A short while back, it was His Majesty who approved of the re-introduction of the time-honoured title of "Pipe-Major" in lieu of the previously tolerated designation of "Sergeant Piper." Nevertheless there is a feeling in Scotland that the N.C.O. charged with the instruction and command of a battalion's pipers should hold warrant rank, like the bandmaster. There is, of course, in every Scottish unit a commissioned officer known as the Pipe President who is responsible for the pipers' welfare and, needless to add, should himself invariably be an adept on the pipes. It is with him the choice often rests as to the tunes to be played on guest nights in the Officers' Mess, an institution in which on special occasions may be witnessed the spectacle of a pipers' march round the table and an exchange of compliments between the Commanding Officer and the Pipe-Major. The Pipe-Corporal is a personage seldom heard of, yet he exists in all pipe bands which boast of enough members to warrant the services of an extra N.C.O.

The Pipe-Major of the one solitary battalion of the Irish Guards wears, like the Pipe-Majors of the Scots Guards, a crown above his

reversed silver chevrons, but in other regiments the crown is not worn and the chevrons are gold. The Irish Guards' pipers came into existence during the late war and are attired in a kilt of saffron hue. Like all pipers they wear the kilt but dispense with what, to the Scot, is part and parcel of its very nature, the sporran. The two other single battalion Irish regiments, The Royal Inniskilling Fusiliers and The Royal Irish Fusiliers, together form for administration purposes one corps, and each battalion boasts of an establishment of pipers. The custom in vogue in Scottish regiments of carrying banners on the pipes is not followed in the Irish regiments and the bagpipe itself is an instrument of different construction from that played by the Highland or Lowland piper. The Royal Inniskillings claim to be the first regiment to use the old Irish war-pipe, and its pipers wear an athol grey uniform with royal blue facings and silver braid, a conspicuous item of the dress being the badger skin bag which hangs in front of the traditional Irish saffron coloured kilt. The remaining Irish regiment, now the Royal Ulster Rifles, as a rifle regiment is content with its bugle band, and consequently has no pipers.

To most Englishmen the names of the Highland regiments are far more familiar than those of the Lowlands, yet it should never be forgotten that it is a regiment of the latter which can boast of being not only the oldest Scots regiment but the oldest regiment in the British Army. This is The Royal Scots (The Royal Regiment), the old 1st Foot, whose Pipe-Major, Charles Dunbar, composed, shortly after the Great War, " Princess Mary's March " in honour of the regiment's Colonel-in-Chief. The majority of pipers who aspire to the post of Pipe-Major are capable of producing pipe compositions, and the reel " Colonel Murray of Giniss " is one of several bagpipe melodies produced by another Pipe-Major of the same regiment, James Duff, a holder of the Highland Society's Gold Medal and a veteran of the South African Campaign and Great War. It was also during the latter campaign, as well as in the Egyptian campaign, that another notable Pipe-Major of a Lowland regiment served, John Balloch, whose " 25th's Farewell to Meerut " is still played by the pipers of the K.O.S.B., this regiment being the original 25th Foot. Mention could be made of scores of other pipe tunes composed by Pipe-Majors of both Lowland and Highland regiments, the most popular being those of the " Farewell " type, addressed to places where regiments have been stationed or to countries in which they have won renown.

Two years ago witnessed the two hundred and fiftieth anniversary of the raising of the Royal Scots Fusiliers, and to mark the commemoration the pipers of this regiment were authorised to adopt the Erskine tartan, Erskine having been the family name of that Earl of Mar who commanded the regiment on its formation. The Scots Fusiliers' pipers

have seen service in many parts of the world, and in a sketch published in one of the illustrated papers in 1879, entitled " The 21st on the War Path," eight kilted pipers are depicted at the head of what is now the 1st Battalion. The fact that they are wading through a river did not apparently interfere with the playing of their pipes. This, of course, was an incident of the Zulu War and recalls the curiosity aroused by the sight of these pipers, the Kaffir women declaring they could not be men, but bearded females!

The pipers of the remaining Lowland regiment, The Cameronians, or Scottish Rifles, are unique in that they are the only pipers serving with a Rifle regiment, just as those of the H.L.I. (City of Glasgow Regiment) are the only Light Infantry pipers of the British Army. It should be borne in mind that in Lowland regiments and in the Highland Light Infantry the pipers are the only men who wear the kilt, the rest of the battalion being attired in tartan trews.

Several stories can be told of individual acts of exceptional bravery on the part of pipers in our older wars. Three at least of these outstanding incidents relate to the H.L.I. All those familiar with Indian military history know of the piper of this regiment who, at the battle of Porto Novo in 1781, played the pipes during eight hours of conflict and was afterwards complimented by General Sir Eyre Coote. He is perhaps not quite as well known as George Clark, also of the 71st, who came to be spoken of as " The Piper of Vimiera," just as nearer to our own time Piper Laidlaw, V.C., of the K.O.S.B., came to be referred to as " The Piper of Loos." Clark's deed had been that of continuing to play his pipes when wounded, his regiment doubtless profiting greatly from this stimulus to their charge. His gallantry has been the subject of two poems including one by Charles Mackay. The third celebrity of the H.L.I. came from the old 74th, now the 2nd Battalion, H.L.I. Thomas Carter of the Adjutant General's Office has honoured his memory in his " Curiosities of War," published just seventy years ago. The story is that Piper John McLauchlan, at the siege of Badajoz in 1812, was amongst the foremost in the escalade and played " The Campbells are Coming " on the castle wall " as coolly as if on a common parade, until his music was stopped by a shot through the bag of the pipes; he was afterwards seen seated on a gun carriage, quietly repairing the damage, perfectly unconcerned about the shot flying around, and presently recommenced his animating tune." This particular piper was afterwards killed whilst playing his pipes at the battle of Vittoria in 1813.

The pipers of the five kilted Highland regiments need no introduction. Those of the Black Watch, the Royal Highlanders, are the most conspicuous in full dress with the Royal Stewart tartan and feather bonnets.

It is curious that their belts should bear the badge of another regiment, the Queen's Own Cameron Highlanders. This distinction, it is thought, commemorates the close association of these two regiments in the Ashanti Campaign of the early 'seventies. In a little-known picture of this campaign by Orlando Norie in the Royal Collection, two pipers are shown at the head of the Black Watch crossing the Omdali.

The Seaforth Highlanders, The Ross-shire Buffs, the Duke of Albany's, is the only Scots regiment whose pipers wear, in common with the regiment, double collar badges. Nor has any other regiment ever had a history written of its pipers such as that compiled a few years ago for the 1st Battalion by Major I. H. Mackay Scobie, the composer of the pipe tune quickstep, "The 72nd's entry into Bagdad," commemorative of the battalion's entry there in 1917. It is an old Seaforth Highlander who now holds the post of Pipe-Major to the splendid pipe band of the Queen Victoria School, Dunblane, a similar institution to the Duke of York's School. One of the best poems ever written about the pipes is that in which J. G. Whittier commemorated the welcome sound to those besieged in Lucknow of the approach of the relieving force headed by the pipes of the 2nd Battalion of the Seaforths. The last stanza runs :

"Dear to the corn-land reaper,
And plaided mountaineer,—
To the cottage and the castle,
The piper's song is dear.

Sweet sounds the Gaelic pibroch
O'er mountain, glen and glade ;
But the sweetest of all music
The Pipes of Lucknow played."

But no member of the illustrious clan of Gordon would fail to prefer the expression found in the old refrain :

"O' a' the tartans east or west
I like the Gordon tartan best."

Was it not the tartan worn by Piper George Findlater, whose playing of "The Cock o' the North," whilst wounded on the Dargai Heights in the Tirah campaign, helped the Gordon Highlanders to gain the heights whilst it won the first piper's Victoria Cross? In the late war only two V.C.'s were awarded to pipers, one being a posthumous award to a Canadian piper, the other—already named—being that awarded to Piper Laidlaw, the ex-Regular, serving with a New Army battalion of the K.O.S.B. In the Great War the piper was a great figure and in the various theatres of operations some five hundred of them found a soldier's grave.

The Queen's Own Cameron Highlanders have always cherished the the memory of the notable piper, Kenneth Mackay, whose vigorous pipe playing outside one of the squares at Quatre Bras has been commemorated in a poem by Alice Macdonald. Another woman, Mary Campbell, wrote the lines of the famous "March of the Cameron Men," the tune that Piper James Stewart of the Camerons was playing when he fell at Atbara in the Sudan Campaign. The Camerons' pipers have often been commemorated by poets. Lord Byron introduced them into "Childe Harold" when describing the scene of their marching by on the eve by Quatre Bras.

On a battalion parade it will be noticed that the pipers of the Argyll and Sutherland Highlanders wear a sporran different from the very attractive pattern worn by the rest of the unit. Like the pipers of all these gallant regiments, those of the old 91st and 93rd, have always acquitted themselves conspicuously in war. It was an ex-sergeant of the last mentioned battalion and a Mutiny veteran, who in a long letter dealing with the merits of pipers, addressed in the early 'nineties to the editor of "The Calcutta Review," made a statement which is well worthy of repetition: "Whoever heard of a Highland regiment going into action without their bagpipes and pipers, unless the latter were all kilt"? Few may now remember the Royal Military Exhibition held in London in 1890, so it may be interesting to recall that the promoters of that exhibition secured the services of the pipers of the Argyll and Sutherland Highlanders to parade the grounds and play popular airs so long as it remained open.

Although pipers do not exist on the strength of English and Welch battalions, certain detachments of that all-British corps, The Royal Marines, have been known to obtain sanction to train and retain the services of a few of its members as pipers for service ashore and afloat.

In conclusion, the pipers of the Indian Army are entitled to a few words. To the presence of Scottish regiments in the East must be attributed the formation of pipe bands in native units, for the early tuition of many oriental pipers can be traced to a Pipe-Major of a Scots battalion.

In the Indian Army one cavalry regiment, at least, did at one time possess a small mounted pipe band, which used to be headed by a kettle-drummer. This was the 17th Indian Cavalry (Bengal Lancers). The 3rd Balooch Battalion of the Bombay Army was one of several regiments of the Indian Army whose pipers wore the Highland plaid wound across the tunic and down the left side in a manner similar to that done by our own pipers. An attractive portrait of a piper of the 10th Battalion, 18th Royal Garhwal Rifles, wearing shorts appeared in an article on the

Indian Army published in a monthly magazine last year. Like a British piper, he was shown wearing the traditional piper's belt across his tunic.

The 17th Bengal Infantry used to have a pipe band, the ten Hindustani Mahomedan members of which presented a very smart appearance in their native turbans and Highland doublets. As the " Loyal Purbiyas " this regiment was raised towards the close of the Indian Mutiny from those who throughout the campaign had remained " nimakh halal " (true to their salt). The fact that these loyal warriors fought in the Afghan Campaign of fifty years ago brings to mind a curious story connected with the earlier campaign in Afghanistan. It concerns an officer, celebrated for his unerring aim with shrapnel shells, who, when serving with General Sale's besieged garrison in Jellalabad, observed about four hundred yards from the walls of the fort a native piper playing on a small hill. Singing and dancing round the piper were several Afghans who periodically made gestures of derision at the garrison. This was more than flesh and blood could stand, so having a mortar carefully loaded the British officer took aim and fired. The shell flew high into the air and then descended on to the head of the piper, where it burst knocking over a score of his companions. From that day on that hill was known as " Piper's Hill " and for aught we know may probably still bear the same name.

AIR CO-OPERATION WITH MECHANIZED FORCES

By WING-COMMANDER T. L. LEIGH-MALLORY, D.S.O., R.A.F.

On Wednesday, 5th March, 1930, at 3 p.m.

LIEUTENANT-GENERAL SIR A. A. MONTGOMERY-MASSINGBERD, K.C.B., K.C.M.G., *p.s.c.*, in the Chair.

THE CHAIRMAN, in introducing the Lecturer, remarked that he had been in charge of the Army Co-operation School at Old Sarum for some years.

LECTURE.

I. INTRODUCTORY.

AT the opening stages of the Great War it appeared that fire power had finally triumphed over mobility, and that war was destined to become an affair of gradual exhaustion, thus offering few if any opportunities for bringing about strategical or tactical coups. War had become static, with one long line of armed men opposing another from the English Channel to the Swiss mountains. The result was that manœuvre of any sort was out of the question. When faced with a deadlock of this nature, it was only natural that military thought should be directed towards a solution of the problem of how to break down the hostile defences and render warfare mobile again. So there came about the evolution of the tank or armoured fighting vehicle, which was capable of surmounting trench systems and wire, thereby penetrating the enemy's lines of defence. At the same time, another new factor, in the shape of aircraft, was first used to break up the enemy's rear organizations and disrupt his communications. It would appear that the influence of these two factors has once more restored mobility and manœuvre to military operations. The question which we now have to consider is how these two factors can co-operate together.

As historical data regarding the problem already exist in the operations of 1918 during the last phase of the war, as well as in the manœuvres of the Armoured Force of 1927 and 1928, it is proposed first to examine what form such co-operation has taken in the past. Then we shall be able to draw some conclusion as to what nature of co-operation must be sought in the future. When these questions have been dealt with, the mutual effect of armoured forces and aircraft on each other will be mentioned.

II. Communication between Aircraft and Individual Tanks.

In June, 1918, No. 8 Squadron R.A.F. was allotted to work with the Tank Corps. It is interesting to note that the point for investigation upon which most stress was then laid arose out of the fact that tanks were very blind, and that aircraft were required to guide them to their objective. Both visual and wireless experiments were tried with this end in view. None of them were particularly successful, and no actual co-operation of this nature took place in battle. The point is mentioned, however, because the question of the communication between reconnaissance aircraft and individual armoured fighting vehicles is constantly cropping up, and in the opinion of the writer it is an entirely erroneous idea.

The demands that are put forward to the aircraft in this connexion fall under two headings :—

(1) To guide armoured fighting vehicles on to their objectives ;

(2) To communicate information direct to the commanders of armoured fighting vehicles.

With regard to (1) : the very fact that armoured fighting vehicles are becoming yearly more numerous would make it increasingly difficult, since the number of aircraft required to carry out this task at all effectively would be out of all proportion to the possible good they might do. Further, it seems that the results might be positively misleading, unless the pilot in the air knew the detailed orders for the armoured fighting vehicles he was under orders to direct. This, in many cases, would be an impossibility. In addition, in order to obtain a sufficiently clear conception of the lie and nature of the ground—an essential condition if direction were to take place—aircraft would have to fly low for prolonged periods, a fact which would result in unjustifiably high casualties. This demand is best met by the improved design of armoured fighting vehicles, and by their crews being supplied with sufficient oblique photographs of the country in which they were about to operate.

With regard to (2) : it would appear that the person who really requires information from the air is the commander who is directing the operation. To launch his armoured fighting vehicles against any objective, he must be in possession of the fullest possible information, a large proportion of which will come from his reconnaissance aircraft. Again, when a movement has been initiated, he, more than anyone else, can turn a possible failure into a success since he controls the reserve. Consequently, it is argued, air reconnaissance must be carried out under the direction of the commander of the armoured fighting vehicle formation. This procedure need in no way prevent subordinate commanders inter-

cepting as much of the air information on their R/T sets as their other signal traffic will allow them to do.

III. The Operations of 1918.

During th operations commencing on 8th August, 1918, and continuing till the Armistice, reconnaissance was carried out during every battle, the necessary instructions being issued to the aircraft by the tank formation commander, and messages in return being dropped at his headquarters. In this way tank brigade commanders were kept informed of the progress of our tanks, while at the same time they were given some idea as to the numbers of tanks knocked out and their own location. As soon as one phase of the battle was over and tanks started to rally, attention was next focused on the movement of enemy's reserves, and information concerning them was dropped not only for the tank formation commander but also at the rallying point, since the next move forward would, more often than not, be directed from that spot. In addition to all this reconnaissance work many oblique and vertical photographs were taken and supplied to the Tank Corps; the obliques being for the use of tank commanders for the purpose of helping them to find their way to the objective, the verticals to enable the General Staff to locate tank obstacles.

Another form of co-operation, which was carried out in some of the battles of 1918, was for aeroplanes to fly over the tanks during the last hour of their approach. This entailed flying in the dark, and in order to deceive the Germans bombs were dropped at intervals a short distance over the lines. It is interesting to note that this was again done during one of the War Office Exercises in 1929, and commented on by the Inspector of Tanks as being a most successful practice.

IV. Anti-Tank Gun Attack in 1918.

This duty constituted the normal work of the army co-operation squadrons attached to the Tank Corps from August, 1918, onwards, but was found to be insufficient. During the battle of the 8th of August it was discovered that, as soon as the tanks had broken through the enemy's main line of resistance, our own guns could no longer support them with the result that the tanks suffered very heavy casualties from anti-tank guns. In consequence, the G.O.C. of the Tank Corps asked the G.O.C. of the R.A.F. whether he might be given further assistance to overcome the difficulty. The matter was fully discussed, and it was thought that single-seater fighters could assist the tanks by being allotted definite areas to watch and attack during the actual advance of the tanks. As soon as an anti-tank gun was located, either as a result of attacking likely spots or by seeing its fire, the personnel working the

gun was to be attacked on the spot. Each fighter pilot was given a map marked with the likely anti-tank gun areas for the purpose. I believe that this proved of very definite assistance to the Tank Corps during the war, and it is possible to recall countless instances during tank attacks from 21st August, 1918, onwards when pilots discovered an anti-tank gun and drove the crew away until the tanks had overrun the position.

From 21st August, 1918, till the end of the war the Tank Corps was allotted a fighter squadron as well as an army co-operation squadron, both being placed under the command of the army co-operation squadron commander for operations.

V. Co-operation with the Armoured Force in 1927–28.

Up to the time that the Armoured Force was constituted in 1927, little co-operation took place between aeroplanes and tanks, apart from a few experiments in inter-communication.

During the two years' existence of the Armoured Force, most intensive co-operation took place. It must, however, be borne in mind that in 1918 the tanks were employed solely in support of normal formations, with a view to breaking through the enemy's defensive system. The Armoured Force, on the other hand, was a self-contained unit designed to operate on its own in a similar manner to an independent cavalry division. Consequently, the problems to be studied in connexion with that force were very different from those encountered in 1918. The operations of the later period, which we are now concerned with, were regarded as originating at a distance of 50 or 60 miles, envisaging wide turning movements and threats to enemy communications. It is obvious that air co-operation with such a force presented much more complex problems than those dealt with in 1918.

In the first place, surprise is essential to the success of this type of operation; consequently, the first demand of an armoured force commander must be for air superiority to be maintained over the area in which he is operating, so that he can be protected against hostile reconnaissance and bombing, either of which forms of attack might seriously upset his plan. But in this connexion it must be emphasized that, while every effort will be made to establish air superiority in the required area, yet it is impossible, except under highly abnormal conditions, to ensure immunity from hostile air reconnaissance. Secondly, he would require extensive reconnaissance to be carried out over a very wide front, perhaps as far as fifty miles ahead of him. It is possible, also, that such reconnaissances might have to be carried out in formation, the strength of which would depend on the air situation. An armoured force commander, moreover, would be almost certain to ask for continuous

air reconnaissance, since it is very largely on the basis of his air information that he would make his plan. If these reconnaissances have to be carried out in formation, more than one squadron might be required for this purpose, with the result that the air reconnaissance being carried out for another portion of the force might require to be curtailed.

In the case of the Armoured Force, the artillery support afforded to an attack carried out by it was found to be insufficient to cope with the scale of anti-tank defence weapons that might be expected in war at the present day. Just as happened to the tanks in the Great War, the armoured fighting vehicles of to-day might become engaged with the enemy defences in a manner which might render it very difficult for the supporting artillery to fire, especially when the tanks disappeared from the sight of the gunners over a crest or beyond a wooded area. It was for this reason that the co-operation of fighters to watch the progress of the armoured fighting vehicles and engage anti-tank guns was found to be necessary. Their co-operation, however, was discovered to be more difficult to arrange than had been the case with the tanks in France. Then, attacks were pre-arranged and worked to a time-table, with the result that the fighters knew exactly when they were to arrive and received definite targets to attack. In the mobile operations undertaken by the Armoured Force difficulty was experienced in getting the fighters to arrive just at the right moment; and when they did arrive their effort was sometimes wasted owing to their task being indefinite. It is evident, therefore, that if fighters are to be employed successfully in operations of this nature they must know :—

(*a*) When the attack is due to take place;

(*b*) The assembly position of the armoured fighting vehicles;

(*c*) The objectives;

(*d*) The special points in the enemy's defences which should be watched for anti-tank guns.

If the fighters can be given this information in sufficient time, they will be able to arrive while the tanks are assembling, and as soon as they see them start to the attack they will then attack the points mentioned in (*d*) above; then, instantly on locating an anti-tank gun, they will attempt to kill or scatter the gun's crew.

It is obvious that if an armoured force commander is to be afforded adequate air reconnaissance, and be able to make proper use of fighters on the occasions when they are allotted to him, he must have good liaison with his air units; he must therefore have either good intercommunication with the aerodrome or there must be an aerodrome in the immediate vicinity of his headquarters. With regard to good liaison it would seem desirable to have the reconnaissance and fighter squadrons,

allotted to an armoured force, grouped in one wing, so that the armoured force commander would thus have only one Royal Air Force officer to deal with. Whether this officer should accompany the armoured force commander, and issue his orders to the squadrons from the armoured force headquarters, or whether he should remain with the squadrons is open to argument. In country where plenty of landing grounds exist, it would seem better for him to remain with the squadrons and fly up and see the armoured force commander as opportunity offers. On the other hand, if few landing facilities exist, it might be better for him to remain with the armoured force commander, relying on a good means of inter-communication to send his orders to the squadrons.

As a means of intercommunication the armoured force commander would employ radio-telephony, by which means he could communicate with his reconnaissance aircraft, although it must not be forgotten that they would at times be operating outside the range of R/T. For point-to-point communication, between armoured force H.Q. and the aerodrome, two-way W/T has been found to work very well.

VI. Present Policy and Problems.

From the above it will be seen that we have now gained experience in co-operation between aircraft and tanks under both static and mobile conditions. It would, therefore, appear that we should be in a position to co-operate in any operations envisaged by the most recently approved policy for armoured formations. Now this policy provides for armoured brigades (light and medium) which can be either attached to a normal formation to assist in a battle conducted mainly by infantry or cavalry, or organized into a separate formation as an armoured force.

There are, however, certain new developments which require discussion :—

(1) The advent of the anti-tank machine gun has rendered the task of fighters assisting a tank attack very much more difficult. In the past fighters have had little difficulty in spotting guns as soon as they opened fire on tanks, but in the future they will not be able to detect anti-tank machine guns in a similar manner. It is possible, of course, that the spots which afford sufficient cover for these weapons may be so few in number as to justify each one being engaged during the whole course of the attack. But when there is abundance of such cover, the most vital points will have to be indicated to the R.A.F. by the General Staff.

(2) The advent of the close support tank may render the employment of fighters for anti-tank gun work unnecessary. It is,

however, believed that cases may arise when close support tanks will be able to give effective support up to a certain point, yet may not be able to afford it at some critical moment; for instance, when the attacking tanks are just breasting a piece of rising ground and likely to come under fire from more distant enemy guns which could not be discovered by the close support tanks. In a case such as this it is thought that fighters might intervene at the critical moment, attacking all likely spots in the enemy defences just as the tanks reach the critical area.

Another point to be considered is that, as the close support tanks will fire smoke almost exclusively, they will make the task of the fighters very much easier. The presence of smoke would indicate to the fighters the approximate position of enemy anti-tank guns and machine guns. Then, while the smoke caused by the close support tanks was still masking the enemy's fire, the fighters would silence the hostile guns by direct attack.

(3) The employment of light tanks in conjunction with a medium tank attack, during which the light precede the medium tanks, to reconnoitre and draw the fire of the enemy, is a new development which may affect the employment of fighters. On occasions when this method of attack might be adopted, it would seem that the most favourable moment for the intervention of the fighters would be during the reconnaissance of the light tanks, since it is possible that the enemy may then disclose his anti-tank gun positions, thereby enabling the fighters to assist the medium tank attack more effectively.

Although much has been said concerning the employment of fighters with armoured forces, yet it must be pointed out that the air situation may be so critical that it would be imprudent to withdraw fighters from the air battle for work with tanks. Moreover, a squadron cannot be selected at random and suddenly detailed for this work. Probably a selected squadron would be earmarked for such a task, the pilots being specially trained for the purpose. Even so, the number of fighter squadrons available in the early stages of a war may make this procedure quite impracticable. It seems, therefore, in view of this fact and of the difficulty of imparting adequate instructions to the fighters in mobile operations, that it would be a sounder policy for armoured formations to develop their own means of overcoming opposition in such situations, and to expect the co-ordination of fighters in the case of a carefully staged attack only.

VII. Summary.

The remarks made up to the present have been of rather a general nature, and no very clear idea of the details of the co-operation between aircraft and armoured forces has been given. It is now proposed to summarize what assistance the R.A.F. can give to armoured forces during the following phases :—

(1) The Preparation ;
(2) The Approach ;
(3) The Attack ;
(4) The Pursuit.

(1) *The Period of Preparation.*—General reconnaissance would be carried out over the area proposed for the operation with a view to discovering obstacles, suitable lines of advance and possible areas of concealment. Such a reconnaissance might on occasions be carried out by the armoured force commander or one of his staff. Photographs would also be taken of selected areas with the same object in view.

(2) *The Approach.*—This would be a most critical period from the point of view of the armoured force commander, since he would have to keep a constant watch on the movements of the enemy so as to be able to make his plan for the attack. Consequently, he would require continuous reconnaissance to locate the position of the enemy forces which he was instructed to attack, and to be kept constantly informed as to their movements. It is quite possible that, at this stage, he might require the R.A.F. to co-operate by means of an attack of bombers and fighters on an enemy column with a view to delaying it sufficiently long to enable him to catch and attack it.

Prior to a dawn attack, the armoured force commander might require aeroplanes to drown the noise of the tanks while the latter were carrying out the last stage of their approach.

(3) *The Attack.*—Reconnaissance of a closer nature would be carried out to report what the effect of the attack had been on the enemy, and whether there were any signs of reserves being brought into the battle.

Fighters, if available, would be employed to attack anti-tank guns. Reconnaissance and fighter squadrons would, if possible, operate from an aerodrome close to armoured force H.Q. during this phase.

(4) *The Pursuit.*—The armoured force commander during the pursuit would be pre-occupied with trying to keep touch with his enemy and cut him off so as to turn his retreat into a rout.

His reconnaissance aircraft would keep him informed as to the whereabouts and action of the enemy, and he would undoubtedly ask

for bombers and fighters to hinder and disorganize the enemy so as to enable him to close with them and rout them.

VIII. The Reciprocal Effect of Armoured Forces and Aircraft.

Lastly, some allusion should be made to the broader aspect of the problem.

Reference has already been made to the fact that it is absolutely essential to the success of an armoured force operation—by this term is understood one where an armoured force is operating independently—that there should be air superiority over the area where the operation is taking place. An armoured force commander will require to be protected as far as possible against enemy reconnaissance, or else he will sacrifice the element of surprise which must usually be essential to such operations.

He will also require sufficient protection for his own reconnaissance aircraft, so that he can obtain that distant information concerning the composition and movement of the enemy which is essential to him to formulate his plan. Another aspect of the problem is that an armoured force is absolutely dependent on its supply of petrol, and that it has been found that supply by tins is more suitable than supply in bulk. This condition entails the formation of large petrol dumps, both at the base and at railheads, and these would in all probability constitute a primary bombing target in cases where armoured forces were being employed. It is not considered probable that armoured fighting vehicles would be subject to air attack while actually in action; but they must constitute a good bombing target when proceeding along a road, or when collected closely together. Obviously, an armoured force commander will try and scatter his command as much as possible for purposes of safety, but it may sometimes be necessary to crowd the vehicles into a small space, either because it is the only means of finding the desired cover, or because the necessity of maintaining wireless silence makes it impossible, for administrative reasons, to scatter the force. In such circumstances armoured forces will be liable to suffer considerable damage if heavily attacked from the air.

While suggesting that aircraft may influence the operations of armoured forces, it is also realized that the converse is the case, and that armoured forces may exercise a considerable influence over air operations.

It is obvious that aircraft must have secure bases from which to operate, also that the further those bases are from the objective to be attacked, the fewer will be the raids carried out against them. By threatening the ground defences of air bases, armoured forces might

be able to drive them so far back as to have an appreciable effect on the security of their own petrol supply.

IX. Conclusion.

In conclusion, it is evident that these two modern arms can each exercise a considerable influence on the activities of the other. It is further maintained that the co-operation of aircraft is a matter of first-rate importance to any armoured force; also that in order to gain the fullest possible effect, the co-operation of aircraft should be viewed from its broadest aspect. The vital importance to an armoured force commander of air information cannot be emphasized too highly; moreover there must also exist a far greater prospect of an armoured force delivering a decisive blow, if the enemy's power of manœuvre can be curtailed by air action to such an extent that the armoured fighting vehicles may be enabled to engage him under the most favourable conditions. Having thus engaged, it may be possible for the armoured force to destroy him.

DISCUSSION.

Group-Captain Gossage: The lecturer stated that he anticipated in the future we might not have fighter aircraft to co-operate with the army co-operation squadrons in assisting the operations of an armoured force. He hinted also at the same time that, should they be available, they might not be of the same use as they were in 1918, in view of the mobile operations of the future.

The point which he brought out in regard to the elimination of fighter squadrons was that they would be required for warfare in the air, and there I am entirely with him. But I suggest that it might be possible to make rather more use of the army co-operation aircraft for what we might call "fighter purposes," that is to say, combining offensive action against enemy guns with their reconnaissances. Whether, with the present aircraft equipment, such a thing is possible I cannot say. It is a form of employment of army co-operation aircraft which is not alien to us, because it has been carried out on the North-West frontier of India, but its possibilities in the kind of warfare which the lecturer has been considering—that is, warfare under "civilized" conditions—have not perhaps been thought out. I should like to hear the opinion of the lecturer on the subject.

Captain E. Altham: It is perhaps rather presumptuous for a naval officer to take part in a discussion of this kind which concerns essentially the other two Services; but the more one studies the development of mobile warfare on shore, the more one finds the other two Services tackling problems similar to those which we in the Navy have been used to for so long. Two points struck me in connection with the problem under discussion to-day. One of them is the question of surprise, to which the lecturer alluded. If aircraft are used in close co-operation with armoured forces there is a danger that, under certain circumstances, they may eliminate that element of surprise which must be so important. The enemy may recognise certain of our aircraft as being those which he is wont to associate with movement of armoured forces, and if he observes them being specially active, he will be on the alert in a way which he would not be if there were only normal aerial activity until "zero hour."

The other point is also the general one that if aircraft, acting in co-operation with ground or surface forces, harass an enemy prematurely, they may frighten him off and thereby prevent those forces engaging and securing a decisive result. A naval analogy would be the indiscreet use of torpedo or bombing aircraft which might damage and frighten off an enemy fleet, thereby frustrating the Commander-in-Chief's efforts to engage with the whole of his forces. In the same way an Army Commander might desire to bring about a decisive action, but if the enemy is prematurely attacked from the air, he may make off before this can be done.

THE CHAIRMAN: Before asking the lecturer to reply, there is one point I wish to raise myself. It arises out of what he was saying towards the end of his lecture. He pointed out the danger to which an armoured force, if concentrated, would be exposed from air attack. I agree that an armoured force would be in considerable danger if caught by bombers, either when it was on the move or, worse still, when it was halted in a narrow area. I would go further. I can foresee a bigger danger from the air if the armoured force is followed up, as it might well be, by long bus columns carrying infantry to support the armoured force during its attack or to take over positions which the armoured force had captured. When it is considered that to move two infantry brigades with their mechanized transport and accompanied by the usual ancillary services would entail some 400 vehicles, covering about 10–12 miles of road space, one realizes what a very vulnerable target they would present to attack from the air. Even if the movement took place by night, I am not satisfied that darkness would be a very great protection. The latest kind of flares show up the movements on roads so well that a long bus column would be nearly as good a target by night as by day.

The question I want to ask the lecturer is whether it would not be possible, and in many cases advisable, to use aircraft for protecting a column like that on the march when that march is of very great importance to the general strategical plan, as it is usually bound to be. I do not think anti-aircraft guns will be able to protect such a long column satisfactorily. They will, no doubt, be effective for defending an area and a certain length of road, but if the bus column is going to cover 60 or 70 miles in a day, and is 10 or 12 miles long, I doubt whether anti-aircraft guns will really be a satisfactory protection. I wonder whether we shall not have to apply to the Air Force to help to protect movement of that sort against enemy aircraft, and I should like to hear the lecturer's views on this question.

COLONEL CARTER: I have a vivid recollection of armoured troops at Villers-Cotteret in 1918 being attached to a French Infantry Brigade which had instructions to take over captured ground, and we found that the armoured force could not get anywhere because it was tied to the infantry accompanying it. I think an armoured force should not attempt to capture ground, but that its purpose should be to destroy the enemy's personnel without reference to the ground occupied. If I were the commander of an armoured force, I would not like to be hampered by infantry of any kind. It would destroy my mobility.

THE CHAIRMAN: I do not think we should proceed with that argument. What I wanted to know was simply whether it is possible to protect a column of vehicles when on the march.

COLONEL CARTER: The point has reference to the concealment of an armoured force prior to an attack. I should hate to conceal an armoured force as I have seen them concealed in woods and villages somewhere in the vicinity of a frontage I was attacking. Personally, I do not agree with the concentration of such a mobile force near enough to the enemy's line to enable him to bomb it freely;

also I think it would upset the idea of surprising the enemy. I would prefer to concentrate my armoured force well out of the enemy's reach, and so far away that my position gave him no indication of the point I was going to attack. I should diminish as much as possible the interval between the time at which the armoured force left the place where it had been laid up and the moment at which it closed with the enemy's forces. It is during that time I should want the accompanying aircraft to give me the greatest help. As soon as I had entered the defender's lines I should anticipate a counter-attack by his tanks so that I should like the Air Force to give me warning of the approach and formations of the hostile armoured force, which I should then expect.

THE LECTURER.

The first question I was asked concerned the possibility of employing army co-operation aircraft against anti-tank guns in any more mobile situations. The point is this: one of the difficulties which arises in employing fighters in those situations for this purpose is the inability of getting orders through to them in sufficient time for them to reconnoitre the area, and be ready to take part in the battle. If that applies to the fighters, it applies also to the army co-operation aeroplanes. To get any additional army co-operation aircraft to the scene of action must be just as difficult as to get the fighters there in time. Probably also there will not be more army co-operation aeroplanes in the air than are required for reconnaissance purposes. We shall have, perhaps, one or two aeroplanes up on reconnaissance when the attack starts, and that will not be enough to keep the commander informed of the progress of his own armoured fighting vehicles and what the enemy is doing, and to undertake also this anti-tank gun work.

The other point is that army co-operation aeroplanes are peculiarly unsuited to the carrying out of that attack. Some of them did perform this kind of work in August, 1918, and the casualties were extraordinarily heavy. I think as a matter of policy it is to be deprecated, and I should prefer not to undertake it.

The point has been raised concerning aircraft giving away the area in which an operation is going to take place. The air is, of course, a very big place, and your reconnaissance aircraft may fly over the enemy lines, casually passing over the area in which they are interested. Consequently, it will be difficult for the enemy to guess which is the critical point solely from the manner in which aeroplanes are flying. Before the battle of 8th August, 1918, we put several extra squadrons on to the front concerned. Pilots in these squadrons had to gain knowledge of the area, but we were only allowed to send up a certain number of aeroplanes each hour, so as not to allow the Germans to realise that these extra squadrons had arrived.

As regards the question of aircraft frightening away a target, that, I suggest, is a factor in naval rather than land operations. In naval warfare the speeds of the two fleets are approximately the same, and if you do frighten the other fleet, it is difficult for one's own fleet to catch it up. If, however, you are using armoured forces against armies organized as they are at present, the relative speeds will not be the same. Divisions with their vehicles have to make progress along roads, and it is at such a time that an armoured force should be able to carry out a flanking movement. It would be rather difficult for a division to disappear, as a fleet can do on receiving warning, since the speed of the armoured force is much greater than the speed of a marching division. Therefore, the division would not have the same chance to get away as would the enemy fleet at sea.

As regards protection by air, I think it really amounts to this, viz., the way in which a marching column is protected depends on the degree of air superiority possessed at the time. Supposing, for example, it were proposed to carry out this kind of movement when holding a fair measure of air superiority, much the same sort of policy would probably be pursued as in 1918. Offensive patrols would be carried out in the neighbourhood of the enemy's aerodromes to prevent him from getting to the area in which the armoured force was operating, and in that way it should be possible to ensure that no more than a few odd enemy aeroplanes would get through. On the other hand, one must consider the situation where air superiority is not secured. The Germans had to face that situation in the war; the Germans, unlike ourselves, centralized the control of their aircraft, and, consequently, when we broke through their front, as we did in August, 1918, the Germans, having a centralised control of aircraft, rapidly concentrated a large number of aeroplanes on that part of the front, with the result that for short periods they practically cleared the air and caused us heavy casualties. When we attacked their retreating columns our squadrons frequently found themselves heavily outnumbered when they reached the objective. I have read a German account of the situation, which states that on 8th August eighty-five British machines crashed in their lines. I have not had an opportunity of checking the figures, but it shows the kind of policy which, if we had not got air superiority, we might have to adopt.

THE CHAIRMAN.

There does not remain much for me to add to this discussion. Several important points raised by the lecturer will require to be considered more closely during the next few years. As our mechanization—and also our aircraft—develops, I feel certain that the co-operation between the two is bound to increase, especially because, although mechanization undoubtedly helps mobility in one way, it may, on the other hand, bring all movement to a standstill if the enemy uses his aircraft properly. I can visualize in certain terrain a very mobile army, which consists altogether of armoured or mechanical vehicles, being completely brought to a standstill for twenty-four hours or more by air action, whereas an army mounted or marching on its feet would have covered fifteen or twenty miles during the same period without very much interruption. I feel certain that as we develop our mechanization and the use of armoured forces, others will be continually working out plans of how to defeat them. That is where the co-operation between mechanized forces and the air, both in offence and defence, is going to be of increasing importance as we work out these problems.

The customary votes of thanks to the Lecturer and the Chairman were carried by acclamation.

THE SITUATION IN THE ADRIATIC

By Major E. W. Polson Newman, B.A., F.R.G.S.

A GLANCE at the map will show that on the West Italy is flanked by France, on the East by Jugoslavia whose government is under the influence of France. On both sides, therefore, the Italian people encounter French influences, and it is the probable effect of these foreign influences on the Italian development of the future that is occupying the mind of Mussolini, both in the military and diplomatic sense. He has, in fact, stated that Italy must be prepared to defend herself, if necessary, against France and Jugoslavia. Such a statement needs some explanation. No one who knows France and French policy can possibly believe that France favours any aggressive designs against Italy, or that the Quai d'Orsay would countenance such policy on the part of the Jugoslavs, who have at present enough trouble in their own country to keep them occupied for a considerable time. French aggression in the ordinary sense of the term is quite out of the question. But there will surely come a time when Italian development may take a form which may be displeasing to her French and Jugoslav neighbours, and it is well within the bounds of possibility that the attitude of these two Powers in combination may be such as to place formidable obstacles in the way of a natural process of Italian expansion by perfectly peaceful and legitimate means. I believe it to be in this sense that Mussolini thinks of French and Jugoslav aggression and feels it necessary that Italy, if necessary, should be in a position to defend herself. A nation that is not prepared to defend her legitimate interests is not worthy of that name; neither is Mussolini the man to allow himself to be deceived by any smooth-tongued pacifism in post-war Europe. It is rather a question whether Italy will be able, by means of her national efficiency and armed strength, to force an issue partly created by the political opposition of others. It is generally accepted in Europe, although it is seldom admitted, that the time will come when something will have to be done to find an outlet for Italy's surplus population, and it may even be that the needs of populations will eventually supersede the present national claims on which the possession of territory is based; but it goes without saying that, when such a question arises for consideration by the League of Nations and the other European Powers, a strong and well-armed Italy will be in a better position to press her case than a country relying solely on the goodwill and generosity of others.

At present the Adriatic is the area to which Italian attention is chiefly drawn, and this may be accounted for by the fact that the Italians regard this sea as one in which they should have supreme command, partly in order to protect the Italian ports of Venice and Trieste and the Hungarian access to the sea at Fiume, and partly to eliminate the danger as far as possible of a submarine attack from the Jugoslav coast. In fact, the five strategic keys to the Adriatic are already in Italian hands: Trieste, Pola, the Cherso and Lussin Islands—guarding the approach to Fiume and the Jugoslav ports (such as they are) in the Quarnero—Lagosta Island, the nearest island to the coast of Italy, and Sasseno Island, at the entrance to Valona Harbour, opposite Brindisi and Otranto at the narrowest part of the Adriatic. Italy also holds Zara on the northern Dalmatian coast, with the result that Jugoslavia feels herself in the position of having no outlet to the sea which is not liable to be rendered useless in the event of war. She has accordingly turned her attention to the acquisition of shipping facilities in a port on the Ægean and, by an arrangement with Greece, concluded on 10th May, 1923, has obtained a free zone in the harbour of Salonica. To reach this, however, it is essential that her trade should not be hampered by any difficulties *en route*, and it is for this reason that she has been filled with misgivings regarding Italy's position in Albania. She regards that country's policy as one of progressive penetration in the Balkans, and her present position in Albania as a potential danger to her communications through the Vardar Valley with Salonica.

The fundamental feature of the Adriatic situation might almost be described as a political tug-of-war between Italy on the one hand and French influences on the other, and the whole framework of Italian policy points to the creation of a combination of friendly states surrounding Jugoslavia, a country bristling with natural submarine bases which, in the event of hostilities, could be of the utmost value to the French Navy which is avowedly strong in under-water craft. Naturally, the Hungarian desire to have a port on the Adriatic fitted in well with Italian ideas, but this desire has become a source of apprehension in Jugoslavia, and has strengthened the growing suspicion that Italy is proceeding to isolate Jugoslavia in the Balkans and South-Eastern Europe generally. The choice of ports lay between Fiume, offered by Italy, and Spalato (or Split), offered by Jugoslavia. Of the two Fiume seemed preferable, as having been the natural Hungarian port before the fall of the Hapsburg Empire. This Hungarian preference for Italy was viewed with a certain disquietude in Belgrade, not only for intrinsic reasons, but because the impression prevailed that, in addition to economic concessions, Italy might arrange a treaty of non-aggression and neutrality, thus scoring a diplomatic success at Jugoslavia's expense. As a matter of fact, a Pact

of Amity between Italy and Hungary was signed in April, 1927, but Jugoslav fears appear to have been somewhat unjustified, since Fiume cannot be reached from Hungary without crossing Jugoslav territory.

The relations between Italy and Jugoslavia, however, have been prevented from becoming anything approaching cordial chiefly by the signature of the Treaty of Tirana in November, 1926, which was interpreted as giving Italy a veiled Protectorate over Albania, where she had already made considerable progress in financial and economic penetration. As this Italian policy of penetration in Albania has in recent years increased rather than decreased, it is not surprising that there still seems little prospect of a peaceful atmosphere on both sides of the Adriatic. Yet, from a military standpoint, it is most unlikely that the Italians would consider using a mountainous country like Albania, with very poor communications, as an avenue of aggression.

What appears to be an aggressive and militaristic spirit pervades the whole Italian nation, women and children included. The Balilla, Avanguardisti and the Milizia system insures that all boys and youths receive military training in some shape or another from about eight years of age, so that by the time they join the army as recruits for their regular military service they are on the high road to being trained men and ready to proceed on annual manœuvres. The work of the Balilla is one of great significance as providing the earliest training of boys as soon as they are in any way fit for it, and it receives special encouragement from the Government, both in direct and indirect ways. Italy could now mobilize about ten per cent. of her population, and the nation as a whole expects something as the culmination of all this military energy. The Italian offer at the Naval Conference to reduce the Navy to any extent, provided that France reduced to the same level, was not an offer to sacrifice strength. Italy was, naturally, willing to reduce a weak fighting arm if France were to reduce to the same level her corresponding arm, which is strong. If Italy were ever to engage France or Jugoslavia in warfare, she would rely chiefly on her army and air service, and a mutual reduction of naval forces to a basis of equality would, in fact, increase Italy's strength.

It should be remembered, however, that discipline forms one of the fundamental conceptions of the Fascist doctrine, and that for this reason the army and military training form a central focus of Fascist life and energy. There is no other national institution that breeds discipline on the same national lines. Further, as in many other countries which have come forward in recent years, the uniformed armed forces of the nation are regarded as the outward and visible sign of independent power. Perhaps the Italians are more susceptible to such influences

than many other nations, but the fact remains that, whatever their actual national strength may be, this strength is considerably affected by their own estimate of its extent. Mussolini, therefore, believes that, whatever may be the actual military power of Italy in relation to her neighbours, it is essential for the increase of their strength that the Italian people should regard themselves as " second to none." Here he is undoubtedly right, and it is in this direction that one must look for a part explanation of the military activity that figures so prominently in Fascist Italy.

But if Mussolini talks to the Italian people in terms of war he is all the time thinking of peace. He knows the strength and weakness of his own country, he knows that Italy cannot " pit " herself against France, although he finds the acceptance of this fact most unpalatable, and he is fully aware that the conversion of his bellicose words into deeds would meet with the strongest opposition on the part of all the civilized nations of Europe. Peace is essential to Italy for the consolidation of the régime which Mussolini has now set himself out to perfect, and in this respect those who now accuse him of warlike intentions merely show their failure to appreciate Italy's vital needs. In spite of his fiery speeches, which have unfortunate reactions in Jugoslavia, it may be assumed that Italy is as opposed to war as an instrument of national policy as any of the other nations that signed the Kellogg Pact. But he believes that Italy needs military stiffening to safeguard her future in the face of possible political opposition on the part of the French and Jugoslavs and the apparent menace of French armaments.

The situation in the Adriatic practically resolves itself into a natural Italian desire to have command of a sea of which more than half the seaboard is Italian territory, and in which are situated important strategical ports. It is the opposition of Jugoslavia, supported by France, to any situation that facilitates, or in fact does not obstruct, Italian penetration in the Balkans. Italy's command of the Adriatic means free use of the Italian ports of Venice and Trieste with their European railway communications; control of sea-borne traffic in and out of Fiume; and free communications with the Jugoslav and Albanian coasts, as well as control of the Straits of Otranto. On the other side, France and Jugoslavia see in the Adriatic an opportunity to confine Italy's sea power to other waters in the event of war, if only that sea were not strategically so favourable to Italy, and possibly also of seriously interfering with Italy's sea communications with the Eastern Mediterranean. Owing to the strategic position of France in Mediterranean waters North of Tunis, it is all the more important to Italy that she should have the fullest freedom of action in the Adriatic.

THE TRAINING OF THE ARMY OFFICER

By CAPTAIN H. C. WESTMORLAND, D.S.O.
The Hampshire Regiment.

"The efficiency of an Army depends on the efficiency of the corps of officers . . . . the Army must produce both leaders and commanders in war and trainers in peace." (*Training and Manœuvre Regulations*, 1923).

I.

THE statement that on the corps of officers depends the efficiency of the Army is more applicable to-day than it was a century or more earlier. By causing dispersion of troops in face of an enemy modern weapons have created the need for real leadership, and the influence of the Commander-in-Chief has been considerably lessened once battle is joined. Consequently, the need for the tactical training of junior commanders is greater to-day than it has ever been.

Before the Peninsular campaign the Army was inefficient for a variety of reasons, but no provision was made for the tactical training of officers. Many officers were imbued with zeal for their profession, but they were self-educated and derived their knowledge of the art of war from the study of the campaigns of Turenne, Marshal Saxe and Frederick the Great, which at this time had not been translated into English. The general standard of tactical efficiency was low except in the artillery, where the officers received a careful training. As late as 1794 officers were promoted according to the number of recruits they had induced to join, a fact which contributed perhaps to the subsequent disasters in Holland. In the following year the Duke of York instilled some sort of discipline into the corps of officers, and their training was improved by the founding of the Royal Military College in 1800.

Between 1800 and the South African War the training of officers in leadership seems still to have been neglected, but after this war training manuals were considerably improved, and an impetus was given to the study of war and its application to the handling of troops in the field. The latter part of the war of 1914–1918 enabled us further to appreciate

the necessity for the more intensive training of our officers in the art of manœuvring even small commands. Yet in spite of all the changes brought about by the war the training of the ordinary regimental officer has remained in principle stationary since 1914. To-day it may include rather more tactical exercises without troops, but the system of training and instructing the officer remains much the same as it was.

II.

Before going further there are two questions that readily come to mind. What is meant by an efficient officer? What is the aim in training the officer? There is little doubt that to-day many officers pass as efficient who, as leaders, may be regarded generally as second-rate. The average officer who is a fair administrator is ranked as competent, and probably too small a value is set on personality until active service exposes its real worth. The basic ingredients of a leader are an elastic mind and a knowledge of human nature, which things cannot be taught. Administrators can be taught, but leaders are surely born.

It is doubtful whether we can produce "both leaders in war and trainers in peace" in one and the same person; a leader and a tactical director, i.e. trainer, are more often than not separate individuals. The most we can hope to do in peace time is to train officers to think clearly and act reasonably under a series of circumstances. Unfortunately, it is one thing to take action knowing that nothing really depends on it, and another to give orders under real battle conditions knowing that lives may be wasted and plans marred by a false move.

In the new syllabus of the course of instruction at the Royal Military College the thing that stands out is the opinion of the authorities that the modern officer must be possessed of a wide outlook. It is safe to assume, therefore, that here is the germ of the efficient officer. Now, if training is to be continued along the lines indicated, an officer must have opportunity for study and the means of keeping up to date in his ideas wherever he is serving. The officer on foreign service is at once placed at a disadvantage: he may be six years without seeing any of the latest developments, and will rarely hear a lecture on a subject of first-rate importance. There are probably cases of officers who gained considerable experience in the last war, but have since served abroad and, consequently, have been unable to add to their store of knowledge in the way that an officer stationed at Aldershot very easily can do.

Environment plays a most important part in the training of officers. It is far easier to conduct a tactical exercise without troops in the military atmosphere of Aldershot than in Multan in India. In many

stations abroad it is difficult to obtain the services of officers of cavalry, artillery and tanks, which robs tactical discussions of a great deal of their interest. As regards the cult of a wide outlook, it must be admitted that garrison life abroad does not provide the same facilities for meeting well-informed opinion as does club life in England. In the Staff Conference at Camberley in January, 1929, a senior officer referred to the senior captains and junior majors as "the weak middle piece" of the Army to-day, but gave no indication of the reason for this circumstance, namely, the fact that half the officers are serving abroad where conditions, particularly in the case of India, are not favourable for the training of officers above the present standard; a fact too little appreciated by those who have done most of their service in England.

III.

In arranging for the training of officers, certain factors have to be considered. The most important is the question of time. Under present conditions the mornings are so taken up with routine that the afternoons are the only available periods. The average scheme takes three afternoons, working from 2 p.m. till 5 p.m., when it gets dark in December and January, allowing two afternoons on the ground and a third discussing the actual writing of orders and administrative details. The more time that can be devoted to tactical training the more efficient will the officers of the Army become in the solution of tactical problems, but if most of the afternoons in the Individual Training season are thus spent, officers will not be able to keep physically fit. Again, we do not aim at producing the non-athletic, studious, uninspiring type of officer; the games-playing officer is the man who can best stand the strain of active service, which fact seems to account for the large number of young commanding officers in the last war.

During the Individual Training period, therefore, mornings must be made available by placing more responsibility for training on warrant and non-commissioned officers. There is far too much tendency to treat the modern officer as a magnified N.C.O., and expect him to learn a mass of wholly unnecessary detail about the working of machine guns and light automatics, whereas the time might be more profitably devoted to the study of the tactical employment of these weapons. "The principal duty of a commander is to make decisions" (F.S.R. ii, Sec. 5).

If officers are to be trained above the present standard, they must be given duties appropriate to the mental proficiency required of them. Pay duties should form no part of an officer's work, other than, possibly, the actual handing over of the cash to the soldier. The establishment of officers might be reduced and a regimental accountant, Royal Army

Pay Corps, substituted, such as exists at the Royal Military College. This accountant would also relieve the second in command of all book-keeping in his (the latter's) capacity as P.R.I., and the time of this officer would then be free to assist in the higher training and instruction of the officers of his unit. The normal court of inquiry and board of survey are waste of a young officer's time, and he is apt to think that any form of higher training is unnecessary if no further demand than this is made on his intelligence.

IV.

The foregoing remarks are intended to illustrate some of the factors that are at present impeding an officer's higher training, and why his training will not improve unless the regimental officer is treated as other than someone on whom to fasten responsibility if things go wrong. The following suggestions, while containing no revolutionary ideas, illustrate the lines on which the present standard of tactical training might be raised.

(1) It is generally recognized that "a prophet hath no honour in his own country." We accept our commanding officer's tactical decisions and arguments, but we are probably more ready to accept those of the brigade or divisional commander. The brigade commander should bear more of the burden of the tactical training of senior regimental officers—the so-called "weak middle piece"—than is generally the case at present. Much value can be had from well-organized tactical discussions within brigades. What is wanted is more inter-change of views, the value of which is well known to officers who have been students at the Staff College and Senior Officers' School or Instructors at the Royal Military College.

(2) As previously stated, more time must be found in normal working hours for the training of officers. This can be done by allowing all training as far as the training of the company to be carried out by the warrant and non-commissioned officers. The proposed work should be, of course, discussed in detail by the company commander beforehand. The duty of superior officers should be to see that ample time is set apart for this higher training of officers.

(3) Alternatively to (2) divisional training might be dispensed with in alternate years and the time devoted to a divisional staff ride, syndicates consisting of officers from different regiments, commanding officers writing orders as brigade commanders, and so on downwards. Selected regimental

officers would fill junior staff appointments in the scheme, their work being supervised by the staff officer in the appointment concerned.

(4) To be a trainer in peace an officer must be able to give a lecture and be able to conduct an exercise without troops. Both duties should form part of the examination for captains for promotion to major. The lecture might be given to the officers of the candidate's brigade, and the tactical exercise might be set as an actual exercise to the officers of a battalion other than the examinee's. The board for this part of the examination would consist of the brigade commander and three commanding officers.

(5) If, as is stated in the Report on the General Staff Conference for 1929, the weak middle piece really exists, then there should be another "axe." Doubtful cases might be sent to the Senior Officers' School to be reported on. As a stimulant to promotion and self-education, there might be a compulsory "axe" of one captain and one major per regiment every second year.

MINOR AIR TACTICS—DEFENCE

By Group-Captain L. A. Pattinson, D.S.O., M.C., D.F.C.

SINCE 1919 much has been written about air fighting, and those who are interested in its development can take their choice in a wide field of study.

The literature of this subject may conveniently be divided into two classes. The first is essentially romantic, and deals with the war exploits of individuals or of squadrons in a manner which is designed for appeal to the general public; the second is professional and comprises Air Ministry manuals, service essays and books, written with a view to instruction or to the discussion of tactical problems.

In this literature the student should find all required information as to the principles upon which attack should be based. In so doing he cannot fail to realise the advantages that their correct application must confer upon the attacker. On the other hand, he might be disappointed if he imagined himself in the position of a defender and looked for guidance in countering these advantages, since he would find the successes of the great individual air fighters usually attributed to the exercise of outstanding skill and determination, while little reference is made to the sound tactical principles on which they undoubtedly relied. Moreover, perusal of R.A.F. Flying Training Manual, Part II, Chapter III (Air Fighting) might confirm the impression gained from historical reading, and lead him to the conclusion that nothing short of exceptional skill, courage and experience could save a pilot who might be unlucky enough to find himself on the defensive.

On the subject of individual air fighting by day, the sectional headings of Chapter III are as follows:—" Individual Attack—General Principles —The Approach—Methods of Attack—Characteristics of the Single-seater in Attack—Characteristics of the Two-seater in Attack—Attack of Two-seater and Multi-seater Aeroplanes " and " Rearguard Action." To the latter are devoted twelve paragraphs as against forty-six, with all the illustrations, under the various headings of attack. The military reader cannot fail to notice the absence from the table of contents of any reference to defence or counter-attack, which, with " retirements," occupy a whole chapter of Field Service Regulations, Vol. II, 1924, in logical sequence after " The Attack."

Any sweeping criticism, based on the cursory treatment of these important subjects, would display a misunderstanding of the Manual's

limitations and of the policy which has governed the development of Royal Air Force tactics in both war and peace. The need for an authoritative statement of the general principles on which air fighting is to be based, and of their application to such situations as afford time for the formulation of a definite plan has been accepted, and is adequately covered by the Manual.

On the other hand, it is clear that defence in which the defender does not possess the initiative, and counter-attack which depends on the seizure of opportunities presented by the enemy both call for instantaneous decision and unpremeditated action. The issue of official solutions for the various problems that might arise under such conditions would be contrary to the well-established policy of encouraging individual initiative, even were it possible within the limited scope of a small volume designed to cover the wide subject of "applied flying." For assistance in forming his own ideas of defence, the post-war pilot must rely on the instruction which he can obtain in the course of squadron work, supplemented by the information contained in Service essays and articles and imparted verbally by his seniors who may or may not be capable of extracting useful lessons from their experience.

The study and discussion of tactics has, since the Armistice, been mainly devoted to the problems of formation flying and to those of premeditated attack and rearguard action which are covered by the Manual. Owing to the inherent danger of collision, the free play of individual defence and immediate counter is rightly excluded from regular peace training. The importance of establishing a few simple principles by the examination of well-authenticated instances of successful defence in war is, therefore, apparent.

It is now proposed to present a few such instances, drawn from the years 1915 to 1917, which have been selected as illustrating the methods evolved by pilots who, in the absence of any generally accepted tactical ideas, were compelled to rely on their own judgment and imagination. Their successors who formed their first impressions of the Western Front during the Battle of the Somme or later gained their experience under different conditions. These, whilst raising the general standard of flying skill, tended to lower the moral of the untried individual when required to act independently. In support of this assertion, some reference is necessary to the changes which influenced air fighting between the early spring of 1916 and the summer of 1917.

The commencement of this period saw a great increase in killing-power, resulting from the development of single-seater fighters and, particularly, of their armament. At the same time, formation flying was introduced and soon became normal for most types of operations.

With the expansion of the Royal Flying Corps and wider experience of fighting, there came recognition of the principles on which modern teaching is based. In particular, the value of initial advantages in attack, and the dangers of separation from the formation in defence, were brought into prominence.

From these developments the half-hearted drew the obvious inferences that air fighting was a most hazardous business; that isolation from a formation added greatly to the danger; and that a fight on the defensive, with the coveted advantages of numerical superiority and height on the side of the enemy but without the compensating factors of exceptional skill or experience, would almost certainly lead to disaster. That the increased mastery of the pilot's art which was a feature of this period gave additional confidence in the actual handling of aeroplanes in action is undoubted; but when account is taken of the new evolutions that it popularised—the loop, the roll and the spin—it is apparent that it could have been of little value in raising the defender's moral.

Because they achieved no change of direction in the horizontal plane, these evolutions were of little or no offensive value. As executed by an inexpert pilot they all involved sacrifice of height with, temporarily, loss of control and of observation of the enemy's movements. They were, therefore, disadvantageous in defence except as temporary expedients for confusing the attacker's aim.

The spin also afforded a precarious means of escape. The danger of relying upon it, even for that inglorious purpose, is emphasized in the following quotation from Flying Training Manual, Part II:—

> "It is not advisable to spin, unless over clouds, as a straight dive is necessary to regain control, when the attacker, if he has followed, will obtain a perfect shot."

The short history of air fighting reinforces the axiom that victory can be won only as a result of offensive action. It has justified, as a corollary, the statement that, when actual combat has once become inevitable, the use of any manœuvre which has no offensive value is unjustifiable. That a stout-hearted pilot can overcome almost any initial disadvantages by the application of certain elementary tactical principles which have commanded victory throughout the centuries of sea and land warfare, was proved on numerous occasions during the Great War.

The following instances of successful defence and counter-attack, in which no abnormal flying was involved, are cited in support of this statement. Of the types of aeroplanes that are mentioned, the tractors were each armed with one or two fixed guns firing forward in the line of flight, and aimed by directing the nose of the aeroplane on to the

target; and the two-seaters possessed, in addition, movable guns for their observers, giving an excellent field of fire behind the wings and on each side of the tail. In the two-seater pushers the observers could fire forward, up or down through a wide angle, and laterally within 80° of the line of flight: the pilots had Lewis guns fixed in the front cockpits, with trigger control operated by means of a short rod extending through the instrument board.

(*a*) In the spring of 1916, the pilot of a British Nieuport single-seater tractor, on patrol a few miles beyond the lines, noticed a German two-seater passing below him. He commenced a dive on to the incautious enemy who immediately put his nose down to escape.

Feeling suspicious, the British pilot glanced quickly round the sky and saw a Fokker monoplane, at about 400 yards range, swooping to the attack. He promptly abandoned his pursuit of the two-seater and flew straight at the new enemy, pulling his machine up so as to bring the gun to bear.

Both pilots opened fire; but the time available, with the range closing towards collision at the rate of nearly a hundred yards in each second, was much too short for effect. The German swerved clear, and broke off the engagement by continuing his dive beyond the limit of pursuit.

(*b*) A few months later the same Nieuport pilot, on dawn patrol, saw a most inspiring sight. Two German two-seaters were flying at 500 feet below his level on the West side of the lines. This gave an opportunity of the kind for which he had hoped during many cold and profitless hours. Every recognised advantage was in his favour—the sun behind him, the height necessary for rapid approach, and the opportunity for fighting over his own territory and for cutting off the enemy's retreat. The memory of previous occasions, on which German two-seaters had invariably avoided his attack by diving away, conjured up a vision of landing to claim the trophy after shepherding it on to the ground.

A flank approach was made in a dive at moderate speed.

As the Nieuport's sights were being finally steadied on to the target, they were suddenly thrown off by a quick turn on the part of the German pilot, which brought his machine nose-on to the attacker. The British pilot had barely sufficient time in which to bring his gun to bear and to fire a few rounds before the consciousness of approaching collision wiped out all thought of aiming.

Filled with rage and disappointment, he determined that he would not give way. With this resolve came the full realisation of what impact would mean. He shut his eyes to keep out the horrid sight of crumpling

wings, and set his controls with rigid obstinacy. When next he looked for his enemy the chance of victory had gone. The morning's work ended with the hopeless pursuit of the two-seaters, over which the Nieuport's superiority in speed was too slight to afford its pilot any opportunity for manœuvre.

(*c*) Early in 1917 the Germans regarded the F.E.2d. two-seater pusher with contempt as being an aeroplane of inferior speed and climb, possessing no field of fire astern. But, in so doing, they underestimated the great stability, the quick turning and the strong position of the observer with a forward-firing gun, for which advantages that machine was designed.

One day, a solitary F.E. which had lost the other members of its formation owing to a series of minor mishaps was patrolling at 11,000 feet a few miles beyond the lines. Three German single-seaters, accompanied by a two-seater, moved to the attack. The British pilot made no attempt to avoid the issue, and the meeting gave him a good opportunity for using his fixed Lewis gun. This fired only a few rounds before it jambed so completely that it remained out of action for the rest of the engagement.

After the first brush, the Germans' tactics were established as a succession of individual dives to the attack, each followed by a climbing turn to regain position. The two-seater, like the single-seaters, used its forward gun. Owing to numerical superiority, the enemy's onslaughts were delivered from various angles and at very short intervals. In spite of this, the F.E. pilot found that he was able to meet each one nose-on as it developed.

Unfortunately for him, two overwhelming disadvantages resulted from the necessity for continuously turning with very steep bank; height was lost with such appalling rapidity that, in the course of twenty minutes' fighting, he had descended from 11,000 to 5,500 feet, and his observer had soon become so giddy that no fire effect could be expected from him. Another alarming factor in the situation was the possibility that the German two-seater pilot would realise the futility of confining himself to short periods of fire with the front gun, curtailed by the necessity of turning to avoid collision, and would give his observer the opportunity for continuous fire at short range by obtaining a position above the F.E. and following its turns concentrically. That the weakness of the defence was appreciated by the enemy was shown by the increasing boldness of their attacks which, by breaking off progressively nearer to the point of collision, lengthened each period of fire at effective range.

Under such conditions, drastic counter-action was clearly necessary. For this the German two-seater pilot gave the opportunity by continuing

one of his dives beyond the limit of safety. He was met by a savage attempt to ram.

The aeroplanes cleared by a few feet and, as they passed, the British pilot had the satisfaction of seeing the evidence of his success in the panic-stricken face of the enemy observer. The result was apparent, both in the immediate abandonment of all attempts to shorten the range and in a general relaxation of pressure.

The engagement ended in the retirement of the F.E., after a bullet had put three cylinders out of action and started a water leak from the engine. The retreat commenced at 5,000 feet from a point four or five miles to the East of the lines and was accomplished by the successful employment of "wounded lion" tactics, involving frequent turns for counter-attack.

(*d*) In the summer of 1917 a formation of D.H. 4's, two-seater tractors of good performance was attacked by a superior force of German single-seaters. Several machines were shot down in the initial encounter, and the survivors became involved in a mêlée in which cohesion was lost.

In the course of the flight a British pilot who had been concentrating his attention on the use of his own gun noticed one of the enemy commencing a flank attack on him. The situation was critical. Maintenance of direction would have resulted in opposing the fire of the observer's one gun against the indifferent target offered by the single-seater's nose to that of two fixed guns directed on to the D.H.4's exposed flank, and in giving the enemy progressively easier shots as the courses of the two aeroplanes came together (Diagram A). A turn-away would have been suicidal, as offering the enemy a perfect position in the blind angle below the two-seater's tail.

The initial courses and positions of the two aeroplanes were such as to compel the attacker to lay his guns, and, therefore, the nose of his machine, considerably ahead of his target, then to rely on its speed and angle of movement across his front to enable him to maintain his fire and to pass behind it without risk of collision (Diagram A.). The British pilot correctly appreciated the situation and turned through 45° towards the enemy, thus disturbing the latter's aim and bringing the aeroplanes rapidly together.

In endeavouring to readjust his sights, the German failed to grasp the significance of this manœuvre, until he found himself faced by the instant necessity of turning to avoid collision. To pass behind or below the D.H.4 had become impossible. He was, therefore, compelled to turn away, thereby offering to his enemy's observer an easy shot at point-blank range with the aeroplanes on parallel courses (Diagram B.). The result was inevitable. The single-seater fell in flames.

DIAGRAM "A".

Scale 2" = 100'

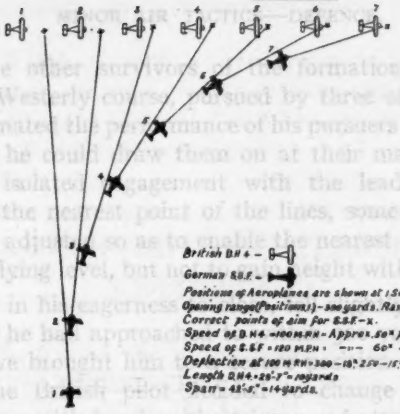
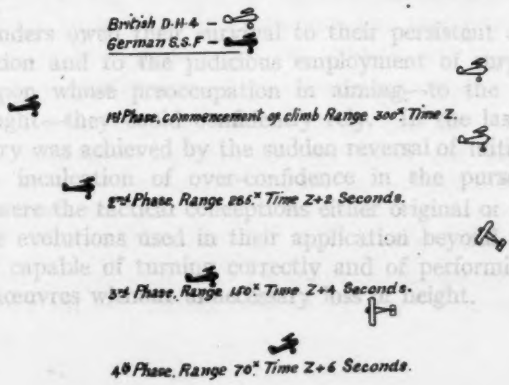

British D.H.4. –
German S.E.5. –
Positions of Aeroplanes are shown at 1 Second Intervals.
Opening range (Positions 1) – 300 yards. Range at Positions 7 – 83 yds.
Correct points of aim for S.E.5. – x.
Speed of D.H.4. = 100 M.P.H. – Approx. 50' per second.
Speed of S.E.5. = 120 M.P.H. – " – 60' – " – "
Deflection at 100 M.P.H. = 300 – 15° 2.50 – 12° 200 – 12° 150 – 9° 100 – 6°
Length D.H.4. = 25'-7" = 307 inches
Span = 42'-6" = 510 inches.

DIAGRAM "B"

British D.H.4. –
German S.E.5. –
Positions of Aeroplanes are shown at 1 Second Intervals.
Opening range (Positions 1) – 300 yds. Closing range (Positions 5) – 40 yds.
Correct points of aim for S.E.5. – x

DIAGRAM "C"

Scale 2" = 100 Yds


British D.H.4. –
German S.E.5. –
1st Phase, commencement of climb Range 300'. Time Z.
2nd Phase. Range 265'. Time Z+2 Seconds.
3rd Phase. Range 150'. Time Z+4 Seconds.
4th Phase. Range 70'. Time Z+6 Seconds.

A' MARDAIG
B' MARDAIG
C' MARDAIG

Following the other survivors of the formation, the D.H.4 then turned on to a Westerly course, pursued by three of the enemy. The British pilot estimated the performance of his pursuers as so little superior to his own that he could draw them on at their maximum speed and thus obtain an isolated engagement with the leader. He therefore headed towards the nearest point of the lines, some ten miles distant, with his throttle adjusted so as to enable the nearest enemy to overtake him steadily by flying level, but not to gain height without losing ground.

The German, in his eagerness to close, fell slightly below the D.H.4, and by the time he had approached to within 300 yards was on a level which would have brought him to a secure position under its tail. At that moment the British pilot decided to change his tactics. He pictured his enemy with hand on the trigger and attention concentrated on the sights. He opened his throttle fully and brought his machine up to its best climbing angle.

This manœuvre caused the German to gain ground and to fall further below his target, so that, in following it with his fixed guns, he over-climbed his aeroplane and lost flying-speed.

The D.H.4 turned quickly through 180° and passed over the helpless single-seater at point-blank range, and at a natural angle of bank which enabled its observer to use his gun with decisive effect. The German's error of judgment in pulling up too steeply had sealed his fate, by depriving him, at the critical moment, of the use of his controls. (Diagram C.).

A detailed analysis of the tactics described in each of the above accounts would make monotonous reading, since manœuvre for collision was employed in all but the last, either as a method for forcing the opposing pilot to alter course and lose his target, or as a desperate expedient with the object of breaking the enemy's moral, or, alternatively, converting the probability of defeat into the certainty of mutual destruction.

The defenders owed their survival to their persistent adherence to offensive action and to the judicious employment of surprise against attackers, upon whose preoccupation in aiming—to the exclusion of tactical thought—they could confidently rely. In the last example a certain victory was achieved by the sudden reversal of initiative, which followed the inculcation of over-confidence in the pursuer.

In none were the tactical conceptions either original or complicated, nor were the evolutions used in their application beyond the capacity of any pilot capable of turning correctly and of performing straight-forward manœuvres without unnecessary loss of height.

THE AFTERMATH OF THE LONDON NAVAL CONFERENCE

THE publication of the terms of the London Naval Treaty has called forth strong protests against ratification in Britain, the United States and Japan: the three countries which will be pledged by it to accept limitations in all classes of ships; and redoubled efforts to increase their fleets on the part of France and Italy: the two countries who refused to be parties to this section of the Treaty.

Whatever the ultimate effects may be, if and when the Treaty is ratified by all the Powers concerned, there can be no question but that up to date all the "measuring of fleets," first at Geneva and then at the London Conference, has for the time being caused more talk of war, more jealous comparisons of armaments, and a greater sense of insecurity than existed before these attempts to ensure peace by mathematical formulæ.

THE QUESTION OF RATIFICATION

In Britain, the gravest anxiety has been expressed by a First Lord and a First Sea Lord who held office during the War, and by a First Lord and a First Sea Lord who only gave up office a few years ago. Mr. Winston Churchill and Lord Bridgman from their political points of view, have been no less emphatic than Admirals of the Fleet Lord Jellicoe and Lord Beatty in their professional arguments against the Treaty. These high authorities and many others qualified to judge what our naval needs are, criticize the terms of the Treaty because they regard the reductions and limitations of our fleet as a serious menace to the safety of this country and the well-being of the Empire.

The main objections raised may be summarised as follows:—

(1) We, the only nation to whom sea power means existence, are the only Power to make any real disarmament or reduction of strength, and that to such an extent as to render us impotent and incapable of protecting ourselves, and of maintaining control over the connecting links of the Empire.

(2) By equalising tonnage, the Washington Agreement did produce "parity" between Britain and the United States in

capital ship strength, but this system cannot be applied fairly to cruisers, because it means definite inferiority for the British Empire, owing to the fact that our cruisers' duties are world-wide, while the American cruisers can be mainly concentrated in home waters.

(3) The aim and object of the Admiralty, up to the time of the change of Government, had been to secure a force of seventy cruisers, as this was considered to be the minimum for our peace needs; yet the Treaty reduces the number to fifty ships.

(4) In addition to this limitation, a clause has been inserted prohibiting Britain from building more than 91,000 tons between now and 1936. This prevents us from replacing ships even to the extent permitted under the "over-age," rules elsewhere in the Treaty. The effect will be that by 1936 we shall have a number of cruisers which are "over age," whereas the United States and Japan are not so restricted in their replacements, while France and Italy (and for that matter any other Power in the world except Germany) are free to build what cruisers they like at any time.

(5) The Treaty would restrict our destroyer strength to an extent which is becoming increasingly dangerous with the continued growth of the submarine forces of our nearest continental neighbour and those of naval Powers in the Mediterranean.

(6) Although British (in company with United States and Japanese) leaders and destroyers will be limited both in size and numbers, other nations are not restricted in any way. Already France and Italy are building so-called leaders which are bigger and more powerful than any we possess or may possess, under the terms of the Treaty.

(7) No mention is made of fleet aircraft in the Treaty. The United States can therefore retain their already overwhelming superiority in these units.

(8) Personnel is not limited by the Treaty, but whereas our naval personnel has already been drastically cut down and will, in all probability, be further reduced, other Powers—especially the United States— are increasing their numbers.

(9) Although the Safeguarding Clause leaves Britain (in company with U.S.A. and Japan) free to increase her fleet if new construction by a nation, other than those three Powers, materially

affects her national security, yet any steps to make good our deficiencies would undoubtedly be regarded as provocative and so tending to disturb International peace.

Lord Beatty summed up the attitude of those who regard the ratification of the Treaty with profound apprehension when, towards the conclusion of his speech in the House of Lords,[1] he said :—

> " We are anxious to see the outcome of this deal, and that anxiety is not confined to any particular political party . . . The belief in the Navy is still existent and it will be a real shock to the people of this country when they wake up to the fact that naval protection is a thing of the past and that we are at the mercy of, and exist only by, the goodwill of other Powers."

On the other hand, there is little doubt but that there is a very general desire for economy in armaments, and Parliament, Public and Press show an indication to favour a Treaty which seems to be a first step towards effecting such economy by international agreement. Those in favour of the Treaty, argue that it will really save us from a much worse dilemma. They emphasize the fact that we are not in a financial position to incur increasing expenditure on the Navy, and therefore it is desirable to secure an agreement which will at least prevent the next most formidable sea Powers from out-building us. While agreeing that we could afford to disregard the United States and take up the attitude that whatever navy that nation chose to acquire it would not be a menace to us, they point out that Japan could scarcely be expected to take a similar view, while we could not ignore Japan, much less could we ignore Continental Powers, who might be influenced by the size of the American fleet. Therefore agreement with the United States, even on terms of so-called " parity," is a vital factor in securing general limitations.

Further arguments advanced in favour of the Treaty are that it is in our interests to secure any possible limitation of foreign 8-inch cruisers, as even one of these would be a far more serious danger to our Commerce in a future war than any of the German auxiliary " raiders " was in the last war. Again, it is observed that the effect of the Treaty will be to reduce drastically the existing tonnage of United States destroyers to equality with our own, and it will actually permit us to increase our submarine tonnage while both the United States and Japan must reduce theirs, which is at present greater than that which we possess.

Added to this, it is urged that the Treaty only holds good until 1936, when the position will again be reviewed in the light of the situation as

[1] 1st July, 1930.

it then appears. Meanwhile, British naval needs have been based on the assumption that no major war can take place during that period; but it is admitted that in the event of such a war, those needs cannot be met except by a very much more powerful fleet than the Treaty would allow, or for that matter, than we have at present.

The Government claim that under the conditions of international relations as they exist to-day, security is not impaired by the terms of the Treaty and that the Board of Admiralty accept that view.

RATIFICATION BY THE UNITED STATES

In the United States opposition to the Treaty would seem to have been engineered largely by individuals who desired to keep in the political limelight. Professional criticism has centred chiefly round the technicalities of the 8-inch and the 6-inch cruiser. One effect of the Conference has undoubtedly been that American naval opinion, in company with that of the other foreign Powers who attended, has been educated very considerably in the true values of the various classes of ships, and the inherent tendency on the other side of the Atlantic to desire the "biggest of its kind," has undergone a certain amount of modification.

It is fair to say that there is a section of people in the United States who genuinely desire economy in naval expenditure, who realize that this striving after "parity" with Britain is dictated by national ambition far more than by real necessity, and that America, far from promoting world-wide reduction in armaments is adding immeasurably to the difficulty of achieving that end, by building a more powerful fleet than they have ever possessed before. But the advantages which the Treaty offers in enhanced prestige, in augmented sea power, and in ability to trade with whom they please in time of war, are so obvious that it is not surprising that, in spite of a certain amount of opposition, which has had the appearance of being more specious than deep-rooted, the United States have led the way in ratification. On 21st July the Senate approved this being done by fifty-eight votes to nine, and on the following day the President signed the Instrument of Ratification and issued a manifesto eulogising this "further long step towards lifting the burden of militarism from the backs of mankind, and speeding the march forward of world peace."

In spite of these pacific sentiments it is evident that America has no intention of delaying the acquisition of the powerful additions to her fleet which the Treaty permits. Mr. Adams, Secretary of the Navy Department, announced the day after the ratification that the construction already authorized will go on, and that the Department will submit a comprehensive building programme to the December session of Congress.

JAPAN'S HESITATION

In Japan, professional opinion has a far greater voice in naval defence than is the case in most other countries. The Minister of Marine is himself an Admiral ; nevertheless, there has been marked divergence between the Ministerial point of view and that of the Naval Staff on the subject of the Treaty. Admiral Kato, Chief of the Naval Staff, claimed his privilege to lay the views of the Naval Staff before the Emperor personally. Subsequently Baron Shidehara, Minister for Foreign Affairs, defended the Treaty in the Diet, but his explanation failed to satisfy naval critics, and Admiral Kato resigned. He was immediately appointed a Member of the Supreme War Council, and was succeeded by Admiral Taniguchi, Commander-in-Chief of the Combined Fleets.

The Supreme War Council met, with the veteran Admiral Togo deputizing for the Emperor as President, and they have drawn up a recommendation dealing with the Treaty. This has been presented to the Emporor by the Prime Minister. The exact terms of this recommendation have not been revealed, but so far as their general sense is known they do not appear to favour unconditional ratification. An extraordinary Session of the Privy Council is being called to consider the Treaty.

FRANCE AND ITALY

The immediate effects of the London Naval Conference in France and Italy can only be said to have been the reverse of those hoped and expected in quarters where it was hailed as a great effort to limit armaments and promote peaceful relations. It has thrown into high relief the rival claims of these two neighbours, especially in the Mediterranean, and rendered more acute those problems which had already begun to strain their relations.

Italy has adhered vigorously to her demand for "parity" with France, who has steadily refused to agree to the justice of this. On 18th June, it was reported that the French Government intended to ask the Chamber for a supplementary credit amounting to about £8,000,000 for national defence. On 28th June, the Italian Government announced their intention to increase military expenditure for the year 1930-31 by £5,500,000, of which over £1,000,000 was assigned to the Navy. This followed on the publication of an extensive new construction programme.[1]

Early in July, however, as the result of negotiations between the two Governments, it was agreed that no new construction shall be laid down before the end of the current year, whereby the *status quo* is maintained during further parleys on naval limitations. Meanwhile,

[1] See Navy Notes, pages 627 and 629.

progress towards a better understanding between the two countries receives periodical set-backs by the highly patriotic but distinctly aggressive utterances of Signor Mussolini.

BRITISH INTERESTS.

The tendency for these Continental Powers to increase their fleets in the Mediterranean is a fact which we cannot ignore; it is in many ways a matter of greater concern to us than the strength of the Japanese navy, and certainly than that of the United States. Not the least serious aspect of the situation is the limitations which the Treaty imposes on designs of warships as well as numbers; limitations which, if we ratify the Treaty, will be binding on us but not on France or Italy.

All that can be said at the moment is that we are taking, indeed have already taken, grave risks by reducing our fleet as we have done. Time alone can show whether other nations will really respond to this "gesture," or whether we shall find ourselves in a position of such danger that, once again, there will have to be an emergency naval programme, if not "panic building." If this should happen it would be merely a case of history repeating itself in an example of post-war apathy towards the fighting Services; of national psychology which desires peace so ardently that it ignores the psychology of foreign nations; and of the tendency of a Power with great possessions to think that it will be left alone to enjoy them by other nations with less at stake.

The real danger to the Empire of allowing the Navy to become unduly weak now, lies in the fact that we cannot retrieve our position swiftly in case of sudden emergency. Trained personnel, and the highly complex material which go to make up a modern fleet, cannot be produced in a few months; yet war has often come about in a few weeks.

It seems timely to recall the words of Sir William Napier:—

> "The English people are warlike without being military, and under the pretence of maintaining a liberty which they do not possess, oppose in peace all useful martial establishments . . . In the beginning of each war England has to seek in blood the knowledge necessary to ensure success."

THE INTERNATIONAL SITUATION

RUMANIA

RECENT events seem to point to further attempts being made by the Rumanian Government to consolidate this somewhat complex state, not only by purging its administrative machinery of some notoriously corrupt personnel, but also by reforming its fighting Services. There is little doubt that Rumanian statesmanship will have to rely largely on the loyalty and efficiency of those Services if it is to succeed in welding together the various national elements which it has absorbed as the result of its post-war expansion. Many years must elapse before that task can be effected.

Rumania now possesses a population of some 17,000,000 inhabitants; the land is well populated right up to its frontiers. It is precisely in those outer districts lying adjacent to its more powerful neighbours that the main source of the country's weakness resides. Strong minorities of non-Rumanian elements inhabit these zones, and they will always be liable to complicate Rumanian political and defence problems as long as Rumania is unable to depend on the complete loyalty of her new subjects. The origin of these minorities, moreover, is varied, a fact which does not simplify the task.

To the West, the Rumanian incorporation of the former Hungarian Transylvania has led to the acquisition of a strong Magyar minority, which reaches a strength of 30 per cent. in many districts, while certain scattered centres of population are almost entirely German in speech and sympathy. If to these elements be added the difficulty caused by the length and situation of the Rumanian frontier marching with Hungary, it is obvious that, in the event of a quarrel with the latter, complications might arise in these districts. Between Rumania, Yugoslavia and Tchekoslovakia there now exists the agreement known as "The Little Entente," and the Rumanians have nothing to fear so long as their allies remain loyal. In either case, the common frontier is short.

With Bulgaria to the South the situation is not favourable, although the relations between the two countries are said to be improving. The long frontier presented by the River Danube is no complete safeguard for Rumania, as was shown by the ease with which Mackensen crossed

it in 1916. It should not be forgotten that the animosity aroused in Bulgaria by the Rumanian intervention in the Second Balkan War of 1913 has not yet subsided, while the surrender of the Dobrudja in 1919 was also a bitter pill to the Bulgars. Even though the greater portion of its population is Turk, the predominant feeling is undoubtedly pro-Bulgar.

It is, however, with the Soviet Union that a far greater possibility of conflict exists for Rumania. By the acquisition of Bessarabia, Rumania has forfeited any probability of a sincere friendship with the Soviet. The population of Bessarabia is only 50 per cent. Rumanian, and also contains several German-speaking communities. It is, moreover, a fertile wheat growing area which was always regarded as a rich province of former Russia. It is clear then that Rumania must depend very largely on clear-headed statesmanship and a wise foreign policy if she is to live in peace with her more powerful neighbour, and thus to gain the necessary time to consolidate her hold on the territory, which was bestowed upon her as the outcome of the Great War, while putting her defences into order. She must rely upon maintaining friendly relations with the Poles, if there should be any risk of hostilities with the Soviet Union.

It is, of course, highly important to Rumania that she possesses, among other sources of wealth, two elements of great natural richness: her wheat and her oil. It follows also that the possession of these valuable commodities should bring her into close relations with the three great Western Powers mainly interested in financing the commerce arising out of the export of this wealth, namely, Great Britain, the United States and France. As a result of this commercial connection Rumania is now showing great interest in the maintenance of her maritime communications with the outside world. For many years past she had maintained a river flotilla for service on the Danube. She is now considering constructing a new fleet for service on the Black Sea. In connection with this and other naval problems a British Naval Mission has recently been advising the Government. The new forces will probably be light craft, supported by aircraft.

If Rumania's land frontiers present some difficult problems from the point of view of defence, much the same holds good of her maritime position. It has, in addition, to be remembered that she has little maritime tradition and a very small seafaring population to support her aspirations to count as a naval factor on the Black Sea. Her harbours, if serviceable, are not large, nor are they of outstanding importance. To the North, Chetatea Alba (formerly Akkerman), near the mouth of the River Dniester, stands but a short distance from Odessa, the great Black Sea port of the Soviet Union, while it is no great distance from Nikolayef

and Sebastopol, the Russian sea and air bases. The mouths of the river Danube are more favourably situated for the use of lesser ships, and it is hoped to create a commercial port on the river. The other Rumanian port of Kostanza is good but not very far distant from the Bulgarian fortified ports, Varna and Burgas. Bulgaria, however, possesses no navy.

On the other hand, the Soviet Union not only possess some fine bases which might be turned to good account in the event of hostilities against Rumania, but it can also exert a heavy threat by land against Bessarabia and could thereby menace the entire Rumanian situation in wartime. In short, for a combined land, sea and air offensive against Rumania, the Soviet Union is favourably placed. The military value of the triple line of the rivers Dniester, Pruth and Sereth is somewhat too problematical to be discussed at this juncture.

The question thus arises as to what aid might come by sea from abroad in the event of hostilities between Rumania and the Soviet Union. The answer to this problem must be found in the attitude of Turkey which still controls the passage of the Dardanelles. Rumania alone, so long as Bulgaria should not make common cause with her, could scarcely apply much pressure on Turkey to open the straits in her favour. An alliance, which, it is true, now seems scarcely probable, between Turkey and the Soviet Union might effectively seal the Black Sea. It is unnecessary to probe the question further as it verges too much on hypotheses which are largely academical in character. Let it suffice to draw attention to the difficulties which might arise if the supply of Rumania's wheat and oil were to be stopped by any quarrel arising out of that somewhat thorny question of the naval hegemony of the Black Sea. Meanwhile, what Rumania will create in the way of air forces and light surface craft remains to be seen. Such forces might possess appreciable value in war on the rivers Dniester and Danube; they might also prove a serviceable auxiliary to foreign naval allies.

THE NEW TREATY WITH IRAQ

THE progress of Iraq towards complete independence has been marked by a succession of steps consisting of various treaties and agreements made with the British Government. We need, however, refer no further back than 1926 to discover the most interesting of the antecedents of the Treaty whose terms have just been published.

In 1926, the British Government undertook to consider every four years whether or not it was possible for them to press for the admission of Iraq to the League of Nations.

In 1927, in a treaty that was never ratified, the British Government undertook to support the claim of Iraq for admission to the League of Nations in 1932, on condition that the rate of progress then prevalent was maintained.

In 1929, the British Government, advised by Sir Gilbert Clayton, decided to support Iraq's candidature for admission to the League in 1932, unconditionally, and promised at once to proceed with the draft of a new treaty of alliance which would come into operation on the admission of Iraq to the League.

This draft has long been under consideration between the two Governments and the agreement eventually reached has been embodied in a new " Treaty of Alliance and Amity " which is to come into force, as agreed in 1929, when Iraq becomes a member of the League.

The principle underlying the relations between the two Governments has been officially defined as " co-operation towards a common end, namely, the early establishment of Iraq as an independent and self-reliant State within the Comity of Nations." To that principle both Governments have held, but there has been considerable difference between them as to the fitness of Iraq at any moment to discharge her future responsibilities. The Iraqi, after four centuries of domination by the Turk, has no present experience or inherited tradition of command or administration. Nevertheless he is very self-confident and, in spite of many early failures, has a firm belief in his own powers. Such a faith is valuable, perhaps even necessary, to a young nation ; but Great Britain with the serious responsibility of the Mandate upon her shoulders, must herself be convinced that there is a solid foundation for such faith before she can recommend her protégé to the world as fully fledged, equal to administering her own affairs, ensuring internal security and defending herself from foreign aggression.

There has been a considerable pressure towards advance on the one hand which has been answered by a seemingly slow and reluctant release on the other ; and the continual clash of views has perhaps complicated relations between the two countries for some years. Our desire honestly to discharge our Mandate has been translated into a determination to remain permanently in the country we had conquered ; while the fantastic claims of the extreme nationalists and the rabid outpourings of a second-rate press have proved inimical to a belief in the capacity of the Iraqi for self-government. All this has proved a serious handicap to the moderates, so much so that it actually caused the suicide of Sir Abdul Muhsin Sadun. Essentially, however, the Moderates have moved sensibly, patiently and persistently towards their goal, and the British representatives, while standing firm against any attempt to

extort concessions, refused to allow their judgment to be prejudiced by the bitterness of the attacks to which they have been subjected.

It is hoped that the new Treaty may prove satisfactory to both parties. When it comes into force, Iraq will be completely independent and will assume the sole responsibility for the administration of her own affairs and internal security, also, subject to the terms of the alliance which have not yet been disclosed, for defence against foreign aggression.

From the military point of view the main interest lies in an agreement which will mean the withdrawal of all British forces from Hinaidi and Mosul within a period of not more than five years from the time the Treaty comes into force. Three air bases to the West of the Euphrates and the Shat-el-Arab will be leased to Britain, the latter to be protected by Iraqi troops, presumably Assyrian levies. Baghdad will thereby be relieved of the irritation due to the presence of alien troops, and the British forces will be concentrated in closer proximity to the large oil interests which it is their duty to protect.

PALESTINE

THE SHAW COMMISSION REPORT

THE Report of the Commission presided over by Sir Walter Shaw, which was appointed to enquire into the immediate causes of the outbreak in Palestine in August, 1929, and to make recommendations as to the steps necessary to avoid a recurrence, was published on 31st March, 1930. The following is a summary of the Commission's principal conclusions and recommendations:—

General Conclusions.

1. The outbreak was, from the beginning, an attack by Arabs upon Jews, for which no excuse has been established. The outbreak was not premeditated, nor was it a revolt against British authority in Palestine.

2. The Commission do not seriously criticize the Palestine Government for their action taken immediately before or after the outbreak, and, in general, they consider the Government have in the past maintained a neutral and impartial attitude between Jews and Arabs.

3. The Commission hold that Jewish enterprise and immigration, when not in excess of the absorption capacity of the country, have conferred material benefits on Palestine in which the Arabs share. They consider, however, that Jewish immigration has not always been regulated by the economic capacity of Palestine to absorb new arrivals, and that Zionist claims have aroused Arab apprehensions of ultimate loss of livelihood and of political subjection.

4. The Commission point out how numbers of Arab cultivators have been evicted on the sale of land, without the provision of other land for their occupation, and they draw attention to the potential danger of a landless and discontented class.

5. The Commission mention certain difficulties inherent in the Balfour Declaration and the Mandate, and refer to the resentment felt by the Arabs at having (unlike the Jews) no regular means of direct access to the Government, and at their continued failure to obtain any measure of self-government.

6. The Commission consider that the policy of reducing the garrison in Palestine and Trans-Jordan was carried too far.

Causes of the Outbreak.

In the opinion of the Commission, the fundamental cause of the outbreak was the Arab feeling of animosity and hostility towards the Jews, consequent upon the disappointment of their political and national aspirations, and fear for their economic future. The immediate causes were :—

(*a*) The long series of incidents connected with the Wailing Wall ;

(*b*) Exciting and intemperate articles in the Press on both sides ;

(*c*) Propaganda among the less educated Arabs of a nature calculated to incite them ;

(*d*) The enlargement of the Jewish Agency ;

(*e*) The inadequacy of the military forces and of the reliable police available ;

(*f*) The belief, due largely to a feeling of uncertainty as to policy, that the decisions of the Palestine Government could be influenced by political considerations.

Principal Recommendations.

1. The primary recommendation of the Commission was that His Majesty's Government should issue a clear statement of policy, particularly as regards the rights of non-Jewish communities, land and immigration, and should make it plain that they intend to give full effect to that policy with all the resources at their command.

2. The Commission recommend that a clear statement should be issued of future policy with regard to the control of Jewish immigration, and that administrative machinery should be reviewed with the object of preventing excessive immigration and of consulting non-Jewish interests.

3. A scientific inquiry should be undertaken as to the prospects of introducing improved methods of cultivation in Palestine, and that meanwhile steps should be taken to prevent the eviction of present cultivators.

4. A Commission should be appointed to determine the question of the Wailing Wall.[1]

5. The question of exercising more effective control over Press propaganda should be examined.

6. His Majesty's Government should re-affirm the statement made in 1922 that the special position assigned to the Zionist Organisation does not entitle it to any share in the Government of Palestine.

7. The existing garrison should be maintained for the present.

8. An independent enquiry should be made into the organization of the Palestine Police.[2]

POLICY OF HIS MAJESTY'S GOVERNMENT.

The following statement of policy was made by the Prime Minister in the House of Commons on 3rd April :—

> His Majesty's Government will continue to administer Palestine in accordance with the terms of the Mandate as approved by the Council of the League of Nations. That is an international obligation from which there can be no question of receding.
>
> Under the terms of the Mandate, His Majesty's Government are responsible for promoting " the establishment in Palestine of a National Home for the Jewish people, it being clearly understood that nothing should be done which might prejudice the civil and religious rights of existing non-Jewish communities in Palestine or the rights and political status enjoyed by Jews in any other country."
>
> A double undertaking is involved, to the Jewish people on the one hand, and to the non-Jewish population of Palestine on the other ; and it is the firm resolve of His Majesty's Government to give effect, in equal measure, to both parts of the Declaration and to do equal justice to all sections of the population in Palestine. That is a duty from which they will not shrink, and to the discharge of which they will apply all the resources at their command.
>
> The report of the Shaw Commission, which is in the hands of Honourable Members, covers a wide field. The Commission was appointed to consider the immediate causes of the deplorable

[1] This is already being done in conjunction with the League of Nations.
[2] This is already being done by Mr. Dowbigging of the Ceylon Police.

disturbances of August last, and to suggest means of preventing a recurrence. In endeavouring faithfully to carry out the terms of reference, the Commission must have found it difficult to draw lines very rigidly. The Government is now studying the various recommendations of the Commission with a view to dealing with the immediate causes of the outbreak, and to preventing a recurrence, and is in consultation with the interests concerned.

INTERNAL SITUATION.

In spite of the publication of the Report of the Shaw Commission and the coincidence during April of Christian, Jewish and Mohammedan festivals, the situation in Palestine has remained quiet.

THE SOVIET-PERSIAN BORDER

THERE has been considerable movement on the part of the population in Russia, North of the Persian border, to escape into Persian territory. This attitude, long resented by the Russian authorities, has assumed the nature though not the proportions of a revolt. The situation is most acute in the neighbourhood of Nakhichevan, a town about twenty-five miles North West of Julfa, which latter town is on the border. Several hundred Mohammedans have crossed the border and arrived at Ardabil; a party of approximately two hundred whilst crossing the Araxes river was almost annihilated by artillery fire from the Russian side: under twenty escaped. Their maintenance and custody form an increasing important political and economic problem for the Persian Government; the canons of humanity preclude the possibility of a wholesale compulsory repatriation. As a condition of their protection they may be requested to become Persian subjects. The reason for this exodus is complex and has several facets, but the agrarian policy in Russia, directed against the Kulaks, and which has increased the intensity of famine conditions, is in a large measure responsible. Religious persecution has forced a large number of many denominations to seek asylum where they may practice their belief unmolested.

Travellers report that a Baku newspaper published a vituperative attack on H.M. the Shah and his regime, which may not be unconnected with the sympathetic attitude which he has shown to the refugees. A reply to this attack was subsequently made in the Persian press in equally corrosive language.

The road from Lake Rezaieh (Urmiah) to the Persian border is being constructed, albeit slowly. It passes from Kaiderabad on the

lake *via* Nagadeh, Garnch, Jalbian, Duab, Khaldar, Dripga and Khaneh to the frontier which is reached in the Gaduk Shrikh gorge. Forty-five kilometres have been made and partly metalled, and a similar distance remains to be constructed. Wheeled traffic cannot pass beyond Duab. Considerable progress has been made with the road in Iraq which will link up Azerbaijan with Rowanduz.

CHAOS IN CHINA

By E. W. MEAD.

(*Late of the British Consular Service and Chinese Salt Administration*).

A RECITAL of the main events that have taken place in China during the current year makes sorry reading.

Chiang Kai Shek, so far from making any headway in his task of bringing the country under one control, has definitely lost ground. Opposition, which a year ago was smouldering and occasional, has blazed out from every quarter in open rebellion. Chiang, with an undoubted superiority in money, military equipment and foreign technical assistance, has so far failed to quell it. Manchuria remains, to all intents and purposes, independent and neutral. The provinces inside the Great Wall, as far South as the Yellow River—including Tsinanfu, the capital of Shantung—are in the defiant grip of Feng Yü Hsiang on the North and West and Yen Hsi Shan on the North and East. The line of the Lunghai Railway from Loyang to Hsuchowfu has been for the past nine months, with but brief intervals, a battle ground of shifting and indecisive fortunes. Reports of these conflicts, according to whether they emanate from Peking or Shanghai, claim victories for one side or the other, but all agree that the fighting has been bloody in the extreme, and not at all the make-believe affair which those unacquainted with modern warfare in China are sometimes led to expect. The net result so far is exhaustion and, possibly, a stalemate.

On the Yangtse, Nanking's control, even of Hankow, has been precarious. Unceasingly threatened from the North by raiders described sometimes as Communist armies, sometimes as Feng Yü Hsiang's irregulars, the metropolis of Central China was in danger during June of a new attack from the South by the redoubtable Chang Fat Kwai and his " Ironsides," allied with Kwangsi " Reorganisationists " under Li Chung Jen. This anti-Chiang combination, the second in importance, has, according to Nanking official reports, been crushed time and again during the past twelve months, its commanders mortally wounded and its forces annihilated. The " Ironsides," however, reappear after each defeat with a bewildering resilience, and an undiminished reputation for

stern fighting qualities. They have ranged the country from Canton to Changsha, the capital of Hunan, which latter city was actually occupied by them in June. It remains to be seen whether their latest defeat in Hunan, effected through the junction of a picked Nanking force with an allied Cantonese expedition, has had more lasting results than the previous reverses inflicted upon them.

It is impossible in a short space either to record or to follow more closely the shifting fortunes of war as between Chiang and his principal opponents. Enough has been said, however, to indicate the grim nature of the "official opposition" to the Nanking regime. But the combinations in the North and South are far from representing the only obstacles to Chiang's supremacy. Banditry and communism are rampant everywhere, and have reduced to a state of ghastly confusion even the five home provinces which almost automatically in the past were wont to give their allegiance to whatever party controlled the wealth of Shanghai and the Lower Yangtse. Cities are reported looted within thirty miles of Shanghai. Periodically Nanking goes in fear of mutiny or bandit attack. The whole of Kiangsi and much of Anhui are delivered up to the depredations of roving bands who slaughter and kidnap with none to gainsay them. In bygone years it used to be remarked that civil war in China interfered but little with trade. The routes remained open for silk and tea. One of the most ominous features of the present chaos is that trade no longer enjoys this immunity. Waterways increasingly tend to become impassable. Goods do not move and trade stagnates. As a result, the business men of Shanghai, Chinese and foreign alike, are passing through a period of unexampled depression, exaggerated as it is by the fall in the value of silver due to entirely extraneous causes. The revenues of the Nanking Government are shrinking in proportion.

So serious has the internal state of China become that observers on the spot are again speculating upon the likelihood of a new partition of the country into five or six units, and it is noteworthy that a place is allotted in such discussions for a communist state or states to be formed out of Fukien, Kiangsi and Anhui. Although, in the opinion of the writer, a permanent Communist Government is absolutely at variance with the Chinese national character, there is undoubtedly a grave danger that a period of Red Terror will supervene over large parts of China. The Russian Soviet's comments on the situation are interesting. The *Pravda* was recently at great pains to recapitulate the various Communist "armies" scattered over the country, and took credit for their successes. It is easy to make light of Chinese brigandage on the one hand, and very difficult to establish the connection between the Soviet Government and the bandits of, for example, Anhui or

Kiangsi. Nevertheless, correspondents have recently remarked that brigand bands widely separated from each other throughout the provinces of Kiangsi, Hupeh, Anhui and Fukien have common purposes and a regular organization, a fact which may reflect Russian expert guidance. If the more powerful and inherently orderly parties in the State continue to exhaust themselves with internecine warfare, the stage may soon be set for another period of anarchy such as the Taiping Rebellion. In such an event, where is the party which would provide that nucleus of authority round which an army could be formed to undertake the restoration of order?

In the midst of this welter of confusion the obvious question arises, how is the foreigner in China faring? It would be idle to pretend that he has any cause whatever to look forward to the future with satisfaction. Matters have advanced a stage further towards the loss of his extra-territorial position. At the end of December, 1929, Nanking issued a Mandate ordering all foreigners to abide by the laws of the Central and Local Governments. The Treaties under which foreigners remained subject to Consular jurisdiction were not honoured with any reference whatever. In anticipation of this virtual denunciation of the Treaties, the British Government had agreed, a few days before, that 1st January, 1930, should be regarded as the date from which the process of gradual abolition of extra-territoriality should commence in principle, and negotiations were to be held to determine method and programme. These negotiations have been delayed by the civil war, but they are proceeding, and official statements from time to time clearly indicate that no opportunity will be lost to settle the question as soon as any Chinese Government is able to achieve sufficient unity by diverting the minds of the people from internal to external affairs. As a first instalment, the Provisional Court in Shanghai, which succeeded the old Mixed Court, has been handed over entirely to Chinese control. No Consular deputies now watch the cases, the executive officials are appointed by the Chinese, and only Chinese civil and criminal procedure is permitted. It is hoped that by dint of good will the new arrangement will be a success, and undoubtedly many Chinese judges, trained in Western schools, are available, and, if left to themselves, will do the bench great credit. But it is, unfortunately, foreign to Chinese ideas that a judge should be free from political dictation, and when it is remembered that three Chief Judges of the Provisional Court recently resigned one after another owing to their inability to maintain the Court's independence, the outlook for an administration of justice in the new Court which shall be free from political bias is not bright. The Court is already refusing to hear cases brought by British firms as plaintiffs, on the ground that they are not registered with the Chinese

Government, a registration from which they are exempt by Treaty. In other words, one of the first uses to which the Court has been put is to deprive British firms of any legal remedy unless they first surrender part of their Treaty privileges.

The retrocession of Wei-hai-Wei is dealt with in another article, but it is a tribute to thirty years of British administration that three hundred villages throughout the leased territory had the courage to raise their voices in protest against rendition, and to petition the British Government to reconsider their decision. It is indeed sad to think of perhaps the pleasantest and happiest spot in all China being engulfed again in the chaos of brigandage and maladministration which is the fate of the rest of Shantung. The question naturally arises—to whom will the British Government hand over the place? Nanking, the recognized Government of China, is presumably not in a position to assume charge at present.

The doom of the Chinese Maritime Customs as an independent administration appears to have sounded, and that great Service which has hitherto stood above Chinese internal strife has followed in the path of the Salt Administration and become a pawn in the Chinese political game. Yen Hsi Shan has taken over the Customs at Tientsin and appointed his own staff to collect the revenue. Nanking can, no doubt, by action at ports of transhipment for Tientsin, counteract the effectiveness of Yen's coup to a certain extent for a time, but unless the Powers intervene no Customs station in future will be immune from seizure by any local war lord who is temporarily powerful enough. The Customs have owed their integrity in the past to the three facts that (1) almost the entire revenue was pledged for foreign loans; (2) the Service was staffed by foreigners, whose extra-territorial position rendered them immune from personal interference by local authorities; and (3) duties were collected in or close to Treaty Ports, i.e., either outside Chinese jurisdiction or at all events in places where the moral effect of foreign warships ensured the orderly transaction of import and export trade and the inviolability of the Customs houses.

Now that China enjoys Tariff Autonomy and, in 1929, a greatly increased revenue, the Powers show no disposition to protect surplus Customs funds for one Chinese party as against another. The abolition of extra-territoriality is imminent. Modification in the status of the foreign concessions is foreshadowed. Consequently, both personnel and offices of the Customs no longer enjoy their ancient sacrosanctity. In a unified China the Customs have still a future, for the Chinese are the first to appreciate the benefits which this Administration has conferred upon them. But in a country torn by internal strife the Customs will

become, in an increasing degree, fair game for any casual despoiler. Let any who doubt this reflect upon the fate of the Salt Administration.

The final settlement of the Chinese Eastern Railway dispute is still awaited. After the invasion of Chinese territory by the Soviet in the autumn of 1929, China accepted the Soviet's conditions for a truce, which included the reinstatement of the Russian Manager and Assistant Manager, and a return to the *status quo* before the trouble began. A conference was held at Harbarovsk in December, but failed to reach any final decision, and the Chinese have now despatched delegates to a further conference in Moscow where parleys are presumably proceeding.

THE RETROCESSION OF WEI-HAI-WEI

THE terms of the Convention by which the territory of Wei-hai-Wei is restored by Great Britain to the full sovereignty of China were announced by the Foreign Office on 5th May, 1930. The following is the text of the Foreign Office statement :—

> " On 18th April, at Nanking, Sir Miles Lampson and Dr. Cheng Ting Ti Wang, Minister for Foreign Affairs of the Republic of China, signed a Convention for the restoration in full sovereignty to China of the territory of Wei-hai-Wei, leased to His Britannic Majesty under the Convention of 1st July, 1898.
>
> " The Convention provides that the British garrisons stationed within the territory shall be withdrawn within one month of its entry into force, which shall take place on its ratification on 1st October, 1930. The transfer of administration and of public properties shall take place on the same day, and the existing administrating regulations, will, as far as possible, be maintained.
>
> " All title-deeds issued to Chinese owners by the British administration of Wei-hai-Wei shall be recognised as being of the same validity as during the British administration. All title-deeds issued to persons other than Chinese shall be exchanged for Chinese deeds of perpetual lease, and all leases issued by the British administration will be recognised.
>
> " Should the Chinese Government decide to close the port of Wei-hai-Wei to foreign residents and trade, with a view to utilising it exclusively as a naval base, the interests of the foreign property-owners and leaseholders will be bought out at a fair compensation, to be agreed upon between the Governments of China and the United Kingdom, who will appoint a joint commission for determining the amount of this compensation in each case.

"Unless the National Government of China decide to close the port of Wei-hai-Wei with the above-mentioned object, they will maintain it as an area of international residence and trade, and will lease to His Majesty's Government for a period of thirty years, with the option of renewal, certain lands and buildings for the requirements of the British Consulate and public interests of the residents.

"All decisions in British Courts pronounced before the rendition of the territory shall be considered to have the force of those pronounced by Chinese Courts.

"Pending the general application of a system of local self-government in China, the Chinese local authorities will ascertain the views of foreign residents at Wei-hai-Wei, in such municipal matters as may directly affect our welfare and interests.

"The two Plenipotentiaries also signed an agreement by which the Chinese Government will loan to His Majesty's Government, free of charge, as a sanatorium and summer resort for the use of His Majesty's Navy, a certain number of buildings and facilities on the island Liukungtao, in the Bay of Wei-hai-Wei, for a period of ten years, with the option of renewal on the same terms by agreement, or on such other terms as may be agreed upon between the two Governments."

The agreement which has now been signed between the British Minister in China and the Chinese Minister for Foreign Affairs brings to a conclusion another chapter of British history in China.

Over thirty years ago, on the plea that some German missionaries had been murdered in the interior of China, a German naval expedition was despatched to seize the port of Kiao Chow (now Tsingtao). This provided an occasion for the German Kaiser to proclaim the might of the "mailed fist." Germany's lead was shortly followed by Russia, who coerced China into "leasing" her Port Arthur; and France followed suit by obtaining the concession of Kwang-chow-wan. China, in alarm at these aggressions, persuaded Great Britain to take a lease of the promontory and harbour of Wei-hai-Wei, midway between the German and Russian territories. The lease was expressly framed to endure "so long as Port Arthur shall remain in the possession of Russia." At the time, no doubt, it was anticipated that this would be, in effect, a perpetual lease. But within ten years Russia was expelled from Port Arthur in the Russo-Japanese war, and since then it cannot be argued that Great Britain had any real right to retain the territory. In fact, our moral obligation to return Wei-hai-Wei to China was recognized by Lord Balfour at the Washington Conference, when he

undertook to restore it to the Chinese on easy terms. An agreement was on the eve of signature in 1924 when the Peiping (Peking) Government was overthrown, and since then there has been no stable Chinese Government with whom any agreement could be concluded.

Under the present convention Wei-hai-Wei is not altogether lost to the fleet, and H.M. ships will continue to use the port as before, unless and until the Chinese Government decide to close the port to foreign residents and trade, and to convert it into a Chinese naval base. It is hoped that this latter contingency will not arise, and conversations with Admiral Tu Hsi-kuei (who recently visited England in the capacity of High Commissioner for the study of naval affairs abroad) suggest that the Chinese Government may eventually decide on some other port with better facilities of communication than Wei-hai-Wei, and one with greater strategical advantages.

The local Chinese population is not enthusiastic at regaining its national independence, and protests have been forwarded to the British Minister. It appears that the villagers of the territory prefer the administration of the "running dogs of imperialism" to that of such faithful sons of the revolution as Chang Tsung-chang and others, by whom the rest of the unfortunate Shantung Province was bled white during their period of tyrannical rule. It is interesting to note that one of the conditional clauses signed separately in an "Exchange of Notes" on which the completion of the Convention depends, is that the Nanking Government must be in effective control of Shantung.

CORRESPONDENCE

[*Correspondence is invited on subjects which have been dealt with in the* JOURNAL, *or which are of general interest to the Services. Correspondents are requested to put their views as concisely as possible, but publication of letters will be dependent on the space available in each number of the* JOURNAL.—EDITOR.]

SHERMAN

TO THE EDITOR OF THE R.U.S.I. JOURNAL.

SIR,—In almost all biographies of great soldiers from Henderson's " Stonewall Jackson " onwards, the subject has been portrayed in the words of the author supplemented by occasional quotations, a method which lends itself most easily to graphic and picturesque treatment. But it also lends itself to the natural tendency of a gifted writer to invest his hero with his own thoughts and theories: the creative imagination has free rein. As literature, this method is wholly delightful; as history, it has drawbacks.

In " Sherman " I deliberately sought to let him speak for himself; by a running current of quotations from his letters, telegrams, and recorded conversations, I tried to let him reveal his own thoughts at each stage of the campaign, and even from hour to hour during battle. Thus the military student might see the actual working of a commander's mind. Sherman was a specially suitable subject for this method because of his utter lack of restraint or reticence. But your reviewer in the May JOURNAL shows no sign of recognizing this difference between imaginative and historical biography, between an author foisting his own opinions on his " hero," and learning from his " hero's " words and actions.

Because I am known to hold unorthodox opinions, he seems to assume that I must be utilising this book to air them. If he reads " Sherman " again carefully he should discover that I credit Sherman with no opinion which is not supported by a quotation from his own words. He might then realise that instead of using Sherman as a puppet, I have learnt from Sherman, and am merely passing on to my readers the lessons he deduced from his own experience and proved by his own practice—and that in a war which in duration, scale, and complexity was the prototype of the World War.

Is it not the truth that many soldiers are content to keep, without question or reflection, the doctrine of war they received in their professional cradle? Yet this doctrine of war—as distinct from minor tactics—has been evolved by pure theory based, at best, on a slender pin-point of historical experience—a very unsafe foundation. For in modern armies the study of history has normally been confined to a few campaigns, and even so officers have gone to them to find examples of, and support for, the current doctrine, rather than to test the truth of this. Research, as understood at a University, has been utterly untried in the Army. Moreover, not only are officers untrained for it, but their training inevitably unfits them for it. The scientific spirit of enquiry cannot exist in an environment where acceptance of the opinions of superior authority is so constantly

enjoined. Let it be understood that I am here making no attack on the system but merely a statement of the difficulties in the path of the student.

There are only three theories which recur at intervals in " Sherman." One is that of the " indirect approach." Now, this first took form in my mind some two years ago, when my fresh study of the American Civil War came to supplement and cement the impressions derived from previous study of other wars. If anyone cares to refer to the files of the Army Quarterly they will find that it was in 1927 that I first mentioned the idea. Yet two years passed before I published the theory in " The Decisive Wars of History." Only then was I satisfied, after a comparative analysis of a still larger range of wars, that the theory had a firm basis in history.

A second theory which recurs in " Sherman " is that of the advantage of moving on a broad front in a wide, loose, grouping instead of concentrated. Here I certainly pretend to no originality. For it was General Colin, the greatest of modern students of Napoleonic history, who pointed out the difference between Napoleon's interpretation of *réuni* and *concentré*, and the way his use of the two terms had been confused subsequently. I merely showed how Sherman revived Napoleon's practice, with great profit although in a degree far less bold than Napoleon.

A third theory is that of taking alternative objectives instead of maintaining one unswervingly. This was an entirely fresh product of research into the records of Sherman's campaigns. Before I felt justified in enunciating it I tested it likewise by a comparative survey of other wars, and if the earlier evidence for it was largely indirect, this was because Sherman was the first commander to formulate it as the guiding principle of his strategic movements. In view of its far-reaching importance, as the very reverse of orthodox notions, I feel that I am far more open to the charge of under-emphasizing it than of reiterating it in " Sherman."

The main purpose of this letter, however, is to show the need for thorough historical research as the only sound test of the abstract theories which masquerade n manuals as " Principles of War."

I am, Sir,

London, Yours, etc.,

July, 1930. B. H. LIDDELL HART.

ARTILLERY AGAINST ELEPHANTS

TO THE EDITOR OF THE R.U.S.I. JOURNAL.

SIR,—In view of the many and frequent comparisons drawn between the use of elephants and of tanks in battle, the following extract from page 120 of " Jackson's Military Anecdotes," published in 1832, may be of interest :—

WILD ELEPHANTS.

Bravery of a Detachment of Bengal Artillery.

In the year 1809, two ferocious or wild elephants made their appearance at the station of the Ramgurh Battalion at Hazaree Baugh. Those animals, which were of uncommon size,[1] did much mischief, but were at length vanquished and put to death, after having made several furious charges on the two four-pounder field-pieces which were brought out against them, Nineteen 4-lb. cannon balls, discharged from those pieces, were taken out of the bodies of the animals after they fell, and it was supposed eight or ten more were buried in their carcasses.

The commanding officer of the corps made an official report on the subject to the Commander-in-chief, and after bestowing great praise on the artillery-men who served the guns, for their extraordinary steadiness and bravery, he related an instance of singular intrepedity on the part of a Sepoy of the Ramgurh Battalion, of which paragraph the following is a correct copy :—

> " In addition to my testimony of the good conduct of the artillery-men, I think it a duty to state, that one of the wild elephants having thrown down a Subadar (native officer) of the corps and his horse, and being on the point of destroying the former, a Sepoy, named Buldee Tewaree, stepped forward to his assistance, charged the animal with so much strength and resolution as to break his bayonet in his trunk, and turn his attention from the Subadar, whose life was thus providentially preserved."

This man was promoted for his manly and generous conduct.

I am, Sir,

R.U.S.I., Yours, etc.,

June, 1930. EX GUNNER.

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[1] The dimensions of the largest were as follows :—Length from end of trunk to end of tail, twenty-six feet nine inches and a half ; height, eleven feet ; round the body, seventeen feet eight inches ; from the crown of the head to beneath the jaw, seven feet.

GENERAL SERVICE NOTES

GREAT BRITAIN

COAST DEFENCE PRACTICE AT H.M.S. "CENTURION."—In the early part of July, Penlee Battery, which forms part of the local defences of Plymouth, carried out experimental full-calibre firing at the Fleet target ship "Centurion." It is understood that the exercises were very satisfactory.

CHILE

FORMATION OF A SEPARATE AIR SERVICE.—In April last a Decree was promulgated whereby the air arms of the Navy and Army are separated from these Services and placed under a Secretary of State as a branch of the Ministry of the Interior. Officers have been given the option of remaining in the new Air Force or reverting to their own Services. The total number of officers affected is about one hundred, including approximately thirty-nine combatant Army Officers and twenty Naval Officers on permanent strength, with about another forty Army Officers attached.

PERU

ORGANIZATION OF AVIATION CORPS.—An important change effecting both the Navy and Army has been the development of the Aviation Corps, and the announcement of the Minister of Marine as to its future part in defence. In his annual report, he said: "Up to the present the Navy has always been considered the first line of defence, but now owing to the development of aviation the aeroplane has acquired great importance and has become a powerful and efficient arm for purposes of national defence. From the first outbreak of war the aeroplane will play a prominent part in whatever defence is required. In the particular case of Peru the defence of her coasts and frontiers will depend almost entirely on aviation." The new Aviation Corps is to be linked up with the Navy and to come under a Ministry of Marine and Aviation.

UNITED STATES

16-INCH COASTAL GUN PRACTICES.—According to a press report an extensive programme of long range target practice from 16-inch coast guns was due to be carried out during May and June. The programme, it is stated "Provides not only for controlling actual firing of the guns at the target, but also the indication of where the target is to the battery ashore by the observer in the aeroplane. The observers will have to do this without approaching near enough to the targets to be within range of the ships' A.A. guns. Up to date, no firing at ranges beyond 30,000 yards have been conducted by the Coastal Artillery owing to the difficulties of terrestrial observation."

NAVY NOTES

GREAT BRITAIN

Flag List Changes.

The strength of the active list of Rear-Admirals has been reduced from forty-eight at the beginning of May to forty-five in July, by the omission to promote Captains in all the vacancies which have occurred.

Admiral of the Fleet the Hon. Sir Somerset A. Gough-Calthorpe, G.C.B., G.C.M.G., G.C.V.O., was placed on the retired list on 8th May, whereby Admiral Sir Roger J. B. Keyes, Bt., K.C.B., K.C.V.O., C.M.G., D.S.O., LL.D., D.C.L.(Oxon.) was promoted to Admiral of the Fleet; Vice-Admiral Sir Arthur A. M. Duff, K.C.B., to Admiral; and Rear-Admiral the Hon. Sir Herbert Meade, K.C.V.O., C.B., D.S.O., to Vice-Admiral. In consequence of the appointment of Rear-Admiral G. F. Hyde, C.V.O., C.B.E., Royal Australian Navy, to command the Third Battle Squadron, as exchange officer, Rear-Admiral E. R. G. R. Evans, C.B., D.S.O., lent to the Royal Australian Navy, ceased to be supernumerary to the establishment. Accordingly no promotion to flag rank was made from the Captains' list.

A further series of changes occurred on 15th May, when Admiral Sir Arthur Duff was placed on the retired list at his own request, whereby Vice-Admiral Sir Cyril T. M. Fuller, K.C.B., C.M.G., D.S.O., was promoted to Admiral, Rear-Admiral A. D. P. R. Pound, C.B., to Vice-Admiral; and Captain H. J. S. Brownrigg, D.S.O., to Rear-Admiral, all to date 15th May.

Admiral Sir William Goodenough, G.C.B., M.V.O., First and Principal Naval Aide-de-Camp to the King, was placed on the retired list, to date 23rd May. In consequence, Vice-Admiral Sir Arthur K. Waistell, K.C.B., was promoted to Admiral; Rear-Admiral L. A. B. Donaldson, C.B., C.M.G., to Vice-Admiral; and Captain W. A. Egerton, C.M.G., to Rear-Admiral.

Vice-Admiral L. A. B. Donaldson was placed on the retired list from 24th May. He will continue to hold his appointment as Admiral Superintendent of Portsmouth Dockyard as a Vice-Admiral on the retired list. In consequence of his retirement, Rear-Admiral H. J. Tweedie, C.B., was promoted to Vice-Admiral, to date 24th May, but no Captain was promoted to Rear-Admiral.

Rear-Admiral Wion de M. Egerton, D.S.O., was placed on the retired list, at his own request, to date 1st June. Again, no promotion was made from Captain to Rear-Admiral.

Flag Appointments.

First Sea Lord.—Admiral Sir Frederick L. Field, K.C.B., K.C.M.G., succeeded to the post of First Sea Lord and Chief of the Naval Staff on 30th July, when Admiral of the Fleet Sir Charles Madden, Bt., G.C.B., G.C.V.O., K.C.M.G., D.C.L.(Oxon.), LL.D., completed three years there.

ATLANTIC FLEET COMMAND.—Admiral Sir Michael H. Hodges, K.C.B., C.M.G., M.V.O., late Second Sea Lord, succeeded Admiral Sir Ernle Chatfield, K.C.B., K.C.M.G., C.V.O., as Commander-in-Chief, Atlantic Fleet, and hoisted his flag in H.M.S. "Nelson," on 26th May.

MEDITERRANEAN COMMAND.—Admiral Sir Ernle Chatfield succeeded Admiral Sir Frederick L. Field as Commander-in-Chief, Mediterranean, on 27th May. Concurrently, the "Queen Elizabeth," after refit, returned to duty as Fleet Flagship. Admiral Field had returned home in the "Warspite," and the unusual spectacle was presented on 26th May of the flags of one Admiral of the Fleet (Sir Roger Keyes) and three full Admirals (Sir Frederick Field, Sir Michael Hodges and Sir Ernle Chatfield) flying in the same port simultaneously.

FIRST BATTLE SQUADRON.—Vice-Admiral Sir William W. Fisher, K.C.B., C.V.O., has been appointed Vice-Admiral Commanding, First Battle Squadron, Mediterranean Fleet, and Second-in-Command Mediterranean, in succession to Vice-Admiral W. A. H. Kelly, C.B., C.M.G., M.V.O., to date 12th September, 1930. The transfer of command will take place on 10th October. Vice-Admiral Fisher was succeeded as Deputy Chief of the Naval Staff on 30th June by Vice-Admiral F. C. Dreyer, C.B., C.B.E.

AMERICA AND WEST INDIES.—Vice-Admiral Vernon H. S. Haggard, C.B., C.M.G., late Fourth Sea Lord, assumed command of the America and West Indies Station on 7th May, in succession to Vice-Admiral Sir Cyril T. M. Fuller, K.C.B., C.M.G., D.S.O., who on his return to England succeeded Admiral Hodges as Second Sea Lord on 26th May.

DIRECTOR OF NAVAL INTELLIGENCE.—Rear-Admiral Cecil V. Usborne, C.M.G., was appointed Director of the Naval Intelligence Division of the Naval Staff, in succession to Rear-Admiral Barry E. Domvile, C.B., C.M.G., to date 15th August.

MEDITERRANEAN FLOTILLAS.—Rear-Admiral Charles M. Forbes, C.B., D.S.O., has been appointed Rear-Admiral (D) Commanding the Destroyer Flotillas of the Mediterranean Fleet, in succession to Rear-Admiral the Hon. Arthur B. S. Dutton, C.B., C.M.G., to date 1st August.

ATLANTIC FLEET FLOTILLAS.—Captain E. O. B. S. Osborne, D.S.O., has been appointed to H.M.S. "Centaur," in command and as Commodore, second class, in command of the Destroyer Flotillas of the Atlantic Fleet, vice Commodore R. C. Dalglish, A.D.C., to date 1st August.

MATERIAL.

SUPPLEMENTARY NAVY ESTIMATES.

A Supplementary Estimate for the Navy for the year ending 31st March, 1931 amounting to £208,200, was presented to Parliament on 9th July. This provision is required to meet the cost that is expected to be incurred during the current financial year on :—

(*a*) The three submarines of the 1929 programme, the construction of which was deferred pending the conclusion of the London Naval Conference, as explained by the First Lord in his Statement Explanatory of the Navy Estimates, 1930. The decision of the Government to proceed with the construction of these vessels was announced to the House of Commons on 21st May, 1930 ;

(*b*) The programme of new construction for 1930, announced by the First Lord of the Admiralty in the House of Commons on 25th June.

(See next page).

Of this total £183,600 is in respect of the three submarines of the 1929 programme and £24,600 in respect of the new construction programme for 1930.

Added to the original Navy Estimates of £51,739,000, the total estimated cost of the Navy for the current financial year is thus £51,947,200, showing a decrease on the Estimates for 1929-30 of £3,917,800.

1930 CONSTRUCTION PROGRAMME.—On 25th June, the First Lord announced in reply to a question in Parliament the new construction programme for 1930, which had been deferred from the Navy Estimates in March in view of the fact that the Naval Conference was still sitting. The new programme includes :—

3 Cruisers, all of the 6-in. gun type.
1 Flotilla of destroyers (comprising 1 leader and 8 destroyers).
3 Submarines.
4 Sloops.
1 Netlayer and target towing vessel.

Orders for the laying down of these ships will not be given until the last quarter of the financial year. It is intended that the allocation of the vessels to be built should be as follows :—By contract : 1 cruiser, 8 destroyers, 1 submarine. In the Royal Dockyards : 1 cruiser and 1 leader, Portsmouth ; 1 cruiser and 3 sloops, Devonport ; 1 netlayer, 2 submarines and 1 sloop, Chatham. An Explanatory Statement by the First Lord on this programme (Cmd. 3620) was issued on 9th July.

1929 PROGRAMME CONTRACTS.—On 21st May, the First Lord announced that orders had been given for work to proceed on the 6-in. gun cruiser, the "Leander," to be built at Devonport Dockyard, and on the two destroyers, " Crusader " and " Comet," to be built at Portsmouth. It was proposed to proceed forthwith with the building of the three submarines. Two would be of approximately 650 tons each, and would be built at Chatham ; and one of approximately 1,800 tons would be built by contract. These three submarines are part of the six originally approved in the 1929 programme, three of which were cancelled and the others suspended until after the Naval Conference.

On 11th June, it was announced that the contract for the machinery of the " Leander " had been awarded to Vickers-Armstrongs, Ltd., and for the machinery of the " Crusader " and " Comet " to Messrs. Hawthorn Leslie & Co., Ltd. The order for the hull and machinery of the flotilla leader " Kempenfelt " has been awarded to Messrs. J. S. White & Co., Ltd., East Cowes, who will also provide the machinery for the new sloops of the " Shoreham " class. The order for the hull and machinery of the destroyers " Cygnet " and " Crescent " has been allocated to Vickers-Armstrongs, Ltd.

1928 PROGRAMME LAUNCHES.—No cruiser is building under the 1928 programme, the " Surrey " and " Northumberland " having been cancelled. The flotilla leader " Keith " was launched at Barrow on 10th July.

Of the eight destroyers of the " Beagle " class in this programme, the " Blanche " was launched at Hebburn-on-Tyne on 30th May, the " Boreas " at Jarrow-on-Tyne on 11th June, the " Brazen " also at Jarrow on 25th July, and the " Basilisk " was due to be launched at Clydebank on 6th August. Of the four Submarines in the programme, the " Rainbow " was launched at Chatham Dockyard on 14th May, and an unusual event was the launching at Barrow on 11th June of all three of the vessels allotted to Vickers- Armstrongs ; these were the " Regulus," " Regent " and " Rover."

1927 PROGRAMME COMPLETIONS.—All the eight destroyers of the 1927 programme, except the "Acheron," the special vessel which is being fitted with high-pressure steam machinery, are now in service with the Third Flotilla, Mediterranean Station. The leader of the same programme, H.M.S. "Codrington," was commissioned at Devonport on 11th June as the ship of the Captain (D), Third Flotilla, in place of the "Keppel." The "Codrington" did well on her trials, a mean speed of 38 knots being maintained for over six hours, and on certain runs the rate approached 40 knots. No attempt was made to press the machinery. The designed speed was 35 knots.

Of the submarines in this programme the "Pandora" was commissioned for trials at Barrow on 23rd May, and the "Proteus" on 28th April. Two had already been finished, the "Perseus" and "Poseidon," and there remain only the "Phœnix," at Birkenhead, and the "Parthian," at Chatham Dockyard, to complete. All are intended for service in China.

CRUISERS OF 1926.—Two of the three cruisers in the 1926 programme, the "York" and "Norfolk," have now been completed, and the third, the "Dorsetshire," is due for completion in the autumn.

The "York" was commissioned at Jarrow on 1st May for passage to the Nore, and completed to full crew at Chatham on 6th May to relieve the "Canterbury" in the Second Cruiser Squadron. The "Norfolk" was commissioned on the Clyde on 28th April with a navigating party, and was completed to full crew on 14th May to relieve the "Comus" in the same Squadron. The "Dorsetshire" will replace the "Frobisher" in this Squadron.

PERSONNEL.

ADVANCED GUNNERY PRIZE.—A prize of £20 has been awarded to Lieutenant R. P. Clark, of H.M.S. "Renown," on the result of the final examination held on completion of the advanced gunnery course at the R.N. College, Greenwich, in March last.

ADVANCED TORPEDO PRIZE.—A prize of £20 has been awarded to Lieutenant F. S. Walford, of H.M.S. "Berwick," on the result of the final examination held on completion of the advanced torpedo course at the R.N. College, Greenwich, in March last.

SHADWELL TESTIMONIAL.—The Shadwell Prize for 1929 has been awarded to Lieutenant-Commander R. K. Dickson, R.N., for his survey of Zante Harbour, executed while serving in H.M.S. "Cardiff." A second prize has also been awarded to Lieutenant D. H. Secker, R.N., for his surveys of Arabi and Farsi Islands, Persian Gulf, carried out while in H.M.S. "Triad." Lieutenant K. Mackintosh, R.N., is commended for his survey of Khor Yiti, carried out while in H.M.S. "Crocus."

OGILVY GOLD MEDAL.—Lieutenant G. T. Smith, R.N., H.M.S. "Vernon," has been awarded the Ogilvy Gold Medal for 1930.

NAVAL TRUST FUND.—Through the generosity of a private donor, a fund has been established known as the "Herbert Lott Naval Trust Fund," which will enable their Lordships to make awards to such of the personnel of the Royal Navy, Royal Marine, Royal Indian Marine and Dominion Navies, whether on the active or reserve strength, as shall show marked efficiency in fighting practices, or who shall contribute in signal degree to the improvement of the fighting appliances of the Naval or Marine Forces of His Majesty. A portion of the income is to be divided proportionately between the respective seagoing fleets and commands

and R.M. Depots, and the Commander-in-Chief is given discretion to make awards to units for efficiency in fighting practices.

THE TRAINING OF BOYS.—A Fleet Order on the drafting of boys to the Third Battle Squadron states that all boys, on leaving the training establishments, are to be drafted direct to this Squadron at Portland to undergo a further training period of at least three months. All boys required as part complement for ships commissioning for the Atlantic Fleet or foreign service are to be demanded by drafting officers direct from this Squadron. In the Third Battle Squadron, boys and ordinary seamen not trained are given instruction in seamanship, school, and physical training. Instruction is not given in gunnery or torpedo. The time available does not admit of the completion of the syllabus in seamanship training, but the full number of hours' instruction is given in boat work.

EXERCISES AND CRUISES.

ATLANTIC FLEET VISITS.—On dispersing from Scapa on 7th June, the vessels of the Atlantic Fleet divided for independent visits to coast towns and resorts. The "Nelson" went to Odde, Norway, Scarborough, Guernsey, Brest and Falmouth, where the whole Fleet reassembled from 11th to 18th July. The "Rodney" left Rothesay on 21st June for Reykjavik, Iceland, conveying the delegation from the British Parliament to the celebration of the thousandth anniversary of the foundation of the Icelandic Parliament. The "Centaur" and Sixth Destroyer Flotilla arrived on 11th June at Helsinki (Helsingfors), and later went on to Stockholm and other northern ports.

MEDITERRANEAN SUMMER CRUISE.—The Mediterranean Fleet left Malta on 2nd July for the first part of its summer programme, which was to last until 20th August. Visits were to be paid to a number of Greek ports and islands, and the "Revenge," with Vice-Admiral W. A. Howard Kelly, was to be off Athens from 19th to 30th July. The Fleet was to reassemble off Argostoli from the 9th to 18th August. The second part of the cruise was to be carried out from 2nd September to 31st October.

AMERICA STATION CRUISES.—The "Despatch" left Bermuda on 16th June for her first cruise with Vice-Admiral Vernon Haggard as Commander-in-Chief, through the Canal to San Pedro, Monterey, and up to British Columbia. The "Dauntless," already on this part of the Station, made a cruise to Wrangell Island and the Arctic Ocean in July. The "Delhi" cruised up the South-East coast of America, and was ordered to make a trip up the Amazon at the end of August. The "Dragon" visited ports in Brazil and the Argentine on her way down this coast, and was to go through to the Pacific via the Magellan Straits in August. The "Durban" cruised in the North Atlantic, and left Halifax on 21st July for home to refit. Her place will be taken by the "Danae."

EAST INDIES STATION.—The three cruisers in the East Indies left their base ports in Ceylon during the last week of June. The "Effingham," flagship of Rear-Admiral E. J. A. Fullerton, proceeded to Mauritius and East African waters, and the "Enterprise" to the Seychelles and East Africa. They were to travel 8,079 and 6,416 miles respectively before returning to Colombo on 24th September. The "Emerald" began a shorter cruise to Madras and in Indian waters.

MISCELLANEOUS.

PRINCE TAKAMATSU AT PORTSMOUTH.—Prince Takamatsu of Japan, a brother of the Emperor, who arrived in England on 26th June to return the Duke of

Gloucester's Garter Mission, paid a visit to Portsmouth on 7th July. He was received at Admiralty House at noon by Admiral of the Fleet Sir Roger Keyes, Commander-in-Chief, and first inspected the "Victory," where he was welcomed by a guard and band and the firing of a Royal salute. After luncheon with the Commander-in-Chief, the Prince visited the "Excellent" and the "Dolphin."

IMPERIAL PRESS CONFERENCE VISIT.—Delegates to the Imperial Press Conference in London also visited Portsmouth on 26th June. A special train conveyed them to Portsmouth Harbour, and they were shown over the "Victory" and the aircraft-carrier "Furious." After being entertained to luncheon at the Guildhall by the Lord Mayor of Portsmouth, they embarked at the South Railway Jetty in destroyers and proceeded to Spithead to witness submarine exercises and attacks by submarines and aircraft upon the destroyers.

PRESENTATION TO H.M.S. "NORFOLK."—On 11th July, during the visit of the "Norfolk" to Great Yarmouth, a presentation to the ship was made by the women of the County of Norfolk of a pair of chased silver porringers, copies of two dated 1662. Funds for the gift were raised by Lady Suffield. The presentation was made by Mrs. Russell Colman, wife of the Lord Lieutenant of Norfolk, and was accepted by Captain C. B. Prickett, R.N.

HYDROGRAPHIC REPORT.—The Report on Admiralty Surveys for 1929, by the Hydrographer of the Navy, Rear-Admiral H. P. Douglas, C.B., C.M.G., was issued early in June. There were issued during the year 58 new charts and diagrams, and 71 plans. Large corrections to chart plates numbered 249, and small corrections 7,632, while no less than 272,741 corrections to charts were inserted by hand. Admiralty notices to mariners published numbered 2,167. Charts printed for use of the Navy and Government Departments were 313,724, and for sale 336,305, the receipts from them being £56,960. H.M. ships discovered 83 new rocks and dangers, and altogether 447 were reported.

DEVONPORT TORPEDO SCHOOL.—H.M.S. "Vulcan," as soon as possible after relief by H.M.S. "Titania" in the early autumn, is to be moved to Devonport to form part of the "Defiance" torpedo training establishment.

FIRST NAVAL TATTOO

CELEBRATION OF THE CENTENARY OF H.M.S. "EXCELLENT."

The Hundredth Anniversary of the establishment of the Naval Gunnery School was celebrated at Whale Island, Portsmouth, by the first Naval Tattoo. The performances took place nightly, starting at 9.30 p.m., from the 24th to the 31st July. Their Majesties The King and Queen attended a special performance on the afternoon of 29th July, and H.R.H. The Prince of Wales the evening performance on 28th July.

The programme started with "beating the retreat," by Guards and bands of the Royal Navy and the 2nd Battalion The Queen's Royal West Surrey Regiment. This was followed by a series of six episodes representing the progress of naval gunnery from 1399 to the present day. The first showed the Earl of Warwick, his archers, a crossbowman, a ballista and a catapult. There followed a scene in which Drake's "Golden Hind," of 1577, was seen engaging an enemy with her culverins. Next a party of Marines appeared in the uniforms of 1664, and carried out drill with ancient matchlocks. A scene showing seamen of Nelson's time serving their guns and repulsing a hostile boarding party was succeeded by one in which the original 4.7-inch gun, mounted on a wheeled carriage by Captain Percy Scott, in the Boer War, appeared with its naval crew from the "Terrible" in khaki and sennet hats. Last of the series was an engagement between a hostile

destroyer and a battery of 6-inch guns representing the anti-torpedo armament of a modern battleship. Sea shanties, cutlass drill, a hornpipe, and field gun displays by guns crews from each of the three Gunnery Schools and the Royal Naval Barracks, Portsmouth, occupied the time until the next scenes. These centred round the visit of George III to Lord Howe's flagship, the "Queen Charlotte," whose traditions are carried on by H.M.S. "Excellent." After an episode showing a raid by a press-gang on a Portsmouth tavern, the setting changed to the quarter-deck of the "Queen Charlotte" and the arrival of the Royal party. The King having received and congratulated the Admiral, the battle was recalled by a miniature action fought by models of the rival ships with their sails and upper works illuminated internally, while mobility was provided by human supports who remained invisible. The battle over, the quarter-deck of the "Queen Charlotte" appeared again with the King presenting Howe with a Sword of Honour. A very impressive finale by the massed 1,200 performers concluded a display which for originality, effect and precision was worthy of the traditional enterprise, efficiency and high organization of H.M.S. "Excellent."

THE FLEET AIR ARM

ATTACHED R.M. OFFICERS.—The attention of Commanding Officers is drawn in Fleet Orders to the importance of taking advantage of every opportunity for employment on ordinary detachment duties of R.M. officers attached to the Fleet Air Arm, in accordance with the conditions of attachment laid down in Article 335, Clause 6, King's Regulations and Admiralty Instructions.

R.A.F. MUSKETRY PRACTICE.—Arrangements are to be made for the R.A.F. personnel embarked in H.M. ships to carry out their annual musketry and pistol practices concurrently with the seamen personnel.

ROYAL MARINES

NEW ADJUTANT-GENERAL.—Major-General Richard V. T. Ford, C.B., C.B.E., has been appointed to be Adjutant-General, Royal Marines, in succession to General Sir Lewis S. T. Halliday, V.C., K.C.B., to date 1st October. On this date Sir Lewis completes three years in the post. Major-General Ford was promoted to that rank on 16th June, and had been for two years in command of the R.M. Depot at Deal.

GENERAL LIST CHANGES.—Lieutenant-General R. C. Temple, C.B., O.B.E., was placed on the retired list on account of non-service on 16th June. In consequence, Major-General Percy Molloy was promoted to be Lieutenant-General; Colonel Commandant (temporary Brigadier) R. V. T. Ford to be Major-General; Colonel Second Commandant L. C. Lampen to be Colonel Commandant (temporary Brigadier) at the R.M. Depot, Deal; Lieutenant-Colonel R. H. Darwall, C.B.E., D.S.O., to be Colonel Second Commandant; and Major J. W. Snepp, O.B.E., to be Lieutenant-Colonel.

FURTHER CHANGES.—Major-General G. L. Raikes, C.B., D.S.C., was placed on the retired list on account of medical unfitness on 26th June. Colonel Commandant (temporary Brigadier) F. H. Griffiths, A.D.C., Chatham Division, was promoted to Major-General; Colonel Second Commandant R. F. C. Foster, C.B., C.M.G., D.S.O., to be Colonel Commandant (temporary Brigadier); Lieutenant-Colonel W. W. Godfrey, C.M.G., to be Assistant Adjutant-General,

Royal Marines, and borne supernumerary, in succession to Brigadier Foster; and Major (Brevet Lieutenant-Colonel) A. S. Cantrell to be Lieutenant-Colonel.

SCHOOL OF MUSIC TO BE REMOVED.—On 6th June, intimation was received by the Lord Mayor of Portsmouth in a letter from the Parliamentary Secretary to the Admiralty that the Royal Naval School of Music at Eastney Barracks is to be transferred to Deal in the autumn. The main reason for the transfer is economy. The number of men at Deal has decreased by approximately 500 during the last few years, whereas the numbers at Portsmouth have been increasing, and, if the School of Music were to remain at Portsmouth, would still further increase as a result of the concentration of land artillery training and other special work there. It is estimated that, besides avoiding future capital expenditure, the transfer will permit other savings of about £7,000 a year. The depot band at Deal is to be abolished.

ROYAL NAVAL VOLUNTEER RESERVE

ULSTER DIVISION.—Captain The Marquess of Dufferin and Ava, D.S.O., S.D.C., who commanded the Ulster Division of the R.N.V.R., was killed in an air accident on the 22nd July. A contingent of the Division from H.M.S. "Caroline" formed a funeral party and acted as escort from the dockside at Heysham to the training ship, where a short service was conducted by the Chaplain of the Division.

BRISTOL DIVISION—CHANGE OF NAME.—The name of the Bristol Division R.N.V.R. has been changed to the Severn Division R.N.V.R.

DOMINION NAVIES.

ROYAL AUSTRALIAN NAVY

FURTHER ECONOMIES.—Among the further economies necessitated in the Navy Estimates owing to the need for retrenchment, the destroyer "Success" was paid off on 20th May, leaving only one unit of this class, the "Anzac," in commission. Commander E. C. Rhodes, R.A.N., succeeded Commander J. W. Durnford, R.N., as Commander (D) in the "Anzac" on 11th April, 1930. As a result of the reductions, the seagoing squadron of the Australian Navy now includes only the cruisers "Australia" and "Canberra," the aircraft carrier "Albatross," and the flotilla leader "Anzac." The surveying ship "Moresby" was paid off into reserve on 8th April, 1930. The destroyer "Huon," launched in 1914, was used as a target by the "Australia" and "Canberra" on their way from Jervis Bay to Sydney on 9th April and sunk.

ROYAL CANADIAN NAVY

LAUNCH OF THE "SAGUENAY."—The 'Saguenay," first of the two destroyers building for the Royal Canadian Navy by Messrs. Thornycroft at Woolston, was launched on 11th July. The "Saguenay" and "Skeena" are similar to the "Acasta" class in the Royal Navy, with certain modifications to fulfil special Canadian requirements.

LOSS OF THE "THIEPVAL."—The minesweeper "Thiepval" went aground on an uncharted rock near Turret Island, Barkley Sound, Vancouver Island, on 27th February. The ship was abandoned, and next day slipped off the rock and sank in fifty feet of water.

ROYAL INDIAN MARINE

LAUNCH OF NEW SLOOP.—The new sloop for the Royal Indian Marine, the "Hindustan," was launched in May at the Wallsend shipyard of Swan, Hunter and Wigham Richardson, Ltd. The vessel is similar to the "Bridgewater" class of sloops, recently designed for the Royal Navy, but modified in certain details to render her more suitable for service in the tropics. She will be propelled by twin screws, driven by geared turbines and supplied with steam from oil-fired boilers, the turbines and boilers being supplied by Hawthorn, Leslie & Co., Ltd. The "Hindustan" was the fifty-seventh sloop launched by the builders.

FOREIGN NAVIES

FINLAND

NEW SUBMARINE.—The first submarine for the Finnish Navy was launched on 2nd June at the Crichton Vulcan shipyard at Abo, in the presence of the President and a distinguished company. According to *The Times* Correspondent at Helsingfors, the event marks the beginning of the realization of a considerable naval programme, authorised by the Diet after protracted deliberations by various expert committees. The submarine has a displacement of 450 tons and a length of 207 feet. The construction of two similar vessels and one of 100 tons is projected. The programme further provides for two gunboats, each of 4,900 tons, and all the vessels are to be built in Finnish yards. The designs were submitted by a Dutch firm, and the armaments have been ordered from Sweden.

FRANCE

FURTHER DEFENCE CREDITS.—It was announced on 18th June that the Government intended to ask the Chamber for a supplementary credit of about £8,000,000 for the purpose of national defence, the sum to be allocated to the needs of the Navy, Army and Air Force. But, on 10th July, M. Briand announced to the Foreign Affairs Commission of the Chamber that no more warships would be laid down before December, so that the Italian Government might be assured of the *status quo* remaining unchanged until that date. The proposal to suspend building in order to help the resumption of France-Italian conversations was first made public by Signor Grandi in a speech on 3rd June. On 13th July, the Italian Government notified its acceptance of M. Briand's proposal, and signified its intention not to lay down any fresh naval units during the period indicated by M. Briand.

MODERNIZATION OF BATTLESHIPS.—All the 23,000 ton battleships are to be converted to oil fuel burning. It is anticipated that the work will be completed by 1932 in four out of six ships.

NEW CONSTRUCTION.—The 10,000 ton cruiser "Dupleix" is due for launching in October next. The "Colbert" is now in commission.

The cruiser due to be laid down this year will be similar to the "Suffren," but with slightly better protection and a small increase in secondary armament. She will have a knot less speed.

The new submarines will be similar to their predecessors, but an effort is being made to improve their main motors, possibly at the expense of a slight decrease in armament.

The submarines " Achille " and " Ajax " were launched on 28th May.

FLOTILLA LEADERS.—The 'Albatross " and " Gerfaut," launched in June last, represent a class of six flotilla leaders of a more powerful and faster type than the six of the " Lion " class, laid down in 1926-27. The displacement is 2,440 tons ; the horse-power, 70,000 ; and the speed, 37 knots, as compared with 36 knots. In addition to the five 5.5-in. and four smaller A.A. guns of the earlier type, one 3-in. gun is carried.

Answering a question in Parliament about this new flotilla leader type, the First Lord of the British Admiralty, Mr. Alexander, agreed on 28th May, that " Under Part III of the London Naval Treaty any vessels we might construct of equal power to the above would come within the definition of cruisers."

GERMANY

ARMOURED SHIP "B".—On 23rd May, the Reichstag refused to sanction the restoration of the grant for the second armoured ship, "B", by a vote of 270 votes to 129. The Ministry of Defence is expected to bring up the proposal again next year, the idea being to provide six vessels of this new type.

Meetings have been held at Wilhelmshafen by the dockyard workers and by the Union of Commerce, Trade and Industry, pointing out the urgent necessity for building this new ship at Wilhelmshafen in order to relieve unemployment and economic stagnation in the district.

Armoured ship "A", or the " Ersatz-Preussen," laid down in the early part of 1929, is due to be launched in September.

OVERSEAS CRUISERS.—The new cruiser " Karlsruhe," cruising in African waters, called at Mombasa and Zanzibar in July.

The visit of a German squadron to the Tagus in June was marred by the shooting of Herr Albert von Baligand, German Minister to Portugal, as he was leaving the flagship, by a German citizen and ex-sailor named Pichowski, who had escaped some time ago from an asylum at Danzig. The Minister died later and his body was taken home on board the " Königsberg," which left Lisbon for Kiel on 11th June.

"U"-BOAT MEMORIAL.—On 9th June, Vice-Admiral Michelsen, who was in charge of German submarines at one period of the late war, unveiled at Kiel a memorial column to that service, erected by subscription. The monument is dedicated to " 5,132 heroes and 199 U-boats " that did not return during the world war.

ITALY

SUBMARINE CRUISE.—The submarines " E. Toti " and " D. Millelire," completed in 1928, returned to Spezia in May, after a cruise of 7,000 miles. Near the Gambia River, the " Millelire " remained submerged for thirty-six hours, which was claimed to be a record. Altogether, the two vessels spent over five and a half days under water.

INCREASED EXPENDITURE.—On 28th June, the Italian Government decided to increase the military expenditure for the year 1930-31 by £5,500,000. Of this

total, over £3,000,000 is assigned to the Army, over £1,000,000 to the Navy, £800,000 to the Air Force, and £200,000 to the National Militia for the equipment and arming of the cohort battalions. The additional expenditure is being obtained by raising, as from 1st July, the tax on all monetary transactions to the uniform level of 1.50 lire per cent.

THE DEFERRED PROGRAMME.—The negotiations between France and Italy for a naval holiday as an initial step towards the resumption of conversations on naval limitation, resulted in an understanding early in July to suspend new building for the rest of the year 1930. (*See* under " France.")

The programme of new construction published on the 30th April last, consisted of :—one 10,000-ton 8-in. gun cruiser, two 5,000-ton 6-in. gun cruisers, four destroyers of 1,240 tons, four submarines of 1,390 tons, six submarines of 810 tons, and twelve submarines of 600 tons. It was originally intended that this extensive new construction should be laid down within eight months, but presumably, it will not be deferred, at any rate until the end of the year. Meanwhile, the existing programme appears to have been speeded up.

JAPAN

POST-TREATY PROGRAMME.—On 30th June, Admiral Taniguchi outlined the naval programme to be adopted in consequence of the London Naval Treaty. According to the Tokio Correspondent of the *Daily Telegraph*, the following measures are intended to make good the loss of naval power arising from the extension of the naval holiday: (1) Modernization of warships to be expedited; (2) Gun elevation in capital ships to be raised. The light cruisers of to-day, mostly equipped with 5.5-in. guns, will, as far as possible, be replaced by 6-in. gun vessels. New 9,000-ton cruisers are to be built carrying 6-in. guns. Light cruisers and submarines are to be properly balanced within the Treaty limits. Measures to be adopted to make good the loss by submarines being scrapped include an additional aerial corps; construction of an aircraft-carrier of 12,000 tons; equipment of 25 per cent. of Japanese warships to receive aeroplanes; and construction of smaller submarines in order to offset the loss of larger vessels resulting from the Treaty.

NEW CONSTRUCTION.—The 10,000 ton cruiser " Takao " was launched at Yokosuka on the 12th May. The completion of the reconditioning of the battle cruiser " Kirishima " has been delayed through serious engine trouble.

GRAND NAVAL MANŒUVRES.—It is announced that Grand Naval Manœuvres will be held in the Pacific in October this year. They will be on an unusually large scale; and all the vessels of the Japanese Navy, with the exception of a few carrying out long refits, will take part.

NEW CHIEF OF STAFF.—On 11th June, it was announced that Admiral H. Kato, Chief of the Naval General Staff, had resigned, and Admiral Shoshin Taniguchi, the commander of the Kure Naval base, was appointed to succeed him. Vice-Admiral Kichisaburo was appointed to succeed Admiral Taniguchi.

NORWAY

NEW CONSTRUCTION.—A new mine-layer and training ship of about 1,700 tons is to be built. The design is for a vessel armed with 4.7-in. guns, an A.A. gun and twin 17-in. torpedo tubes. She will carry about 280 mines and have a speed of 20 knots.

PERU

ESTIMATES.—The Navy and Air Estimates for the current year amount to £823,396, as compared with £675,717 in 1929, and £565,229 in 1928. The increase is due to the development of a combined naval and military air force, called the Aviation Corps, the vote for which comes under the Ministry of Marine and Aviation, whereas in previous years the vote for military aviation was included in the Army estimates.

PORTUGAL

NEW NAVAL PROGRAMME.—On 9th July, the details of the naval programme of the 1930-31 Budget were made known by the Lisbon Correspondent of *The Times*. The programme, to extend over eight years, will involve an expenditure of £12,000,000, and will be divided into four periods, as follows :—

First Period.—Two despatch boats of 2,000 tons and four of 1,000 tons; four destroyers of 1,500 tons; two submarines of 800 tons; two gunboats, one aircraft carrier for twelve aeroplanes.

Second Period.—One cruiser of 5,000 tons; two destroyers of 1,500 tons; four submarines of 800 tons.

Third Period.—One cruiser of 5,000 tons; two despatch boats of 2,000 tons and two of 1,000 tons; two destroyers of 1,500 tons; two submarines of 500 tons.

Fourth Period.—Two despatch boats of 1,000 tons; four destroyers of 1,500 tons; four submarines of 500 tons; one submarine depot-ship.

ROUMANIA

BRITISH NAVAL ADVICE.—Rear-Admiral R. G. H. Henderson, C.B., was invited by the Roumanian Government to advise them about the construction of a naval base on the Black Sea. He was received by Dr. Maniu, the Prime Minister, in Bucharest on 6th April. Rear-Admiral Henderson left for England on 24th June, after presenting his report to the Roumanian Government.

SPAIN

A ROYAL CADET.—In June, the Infante Don Juan, third son of King Alfonso, passed the entrance examination for the Navy. The Madrid Correspondent of *The Times* recalls that one must go back almost to the days of Don John of Austria, the victor of Lepanto, to find a Spanish sailor prince, "and the decision of the King to send one of his sons into the Navy is a popular one and will no doubt contribute to the progress made of recent years in rebuilding a Navy worthy of its past traditions."

UNITED STATES

NAVAL APPROPRIATION BILL.—The Naval Appropriation Bill passed the Senate on 26th May with a total of 380,669,386 dollars, an increase of 97,875 on the amount at the time it left the House of Representatives. This is 18,484,359 more than the appropriations for the fiscal year ended on 30th June, 1930.

SUSPENDED CRUISERS RESUMED.—On 2nd June, Mr. Adams, Secretary for the Navy, announced that the keels of the three new 10,000-ton cruisers, the construction of which had been suspended by President Hoover, would be laid soon. These were the three dockyard-built ships of the programme of five ordered in July, 1929.

NEW CRUISERS NAMED.—The five cruisers ordered in 1929 have been named as follows: "New Orleans," building at New York Navy Yard; "Portland," at the Bethlehem Company, Quincy, Mass.; "Astoria," at Puget Sound Navy Yard; "Indianapolis," at the New York Shipbuilding Company, Camden, N.J.; "Minneapolis," at Philadelphia Navy Yard.

NEW CRUISER DESIGNS.—Writing on 7th June, the Washington Correspondent of the *Morning Post* stated that the new designs for the ten American cruisers with 8-in. guns still to be built are drawn largely from the German "Ersatz-Preussen." Weight is to be saved by welding instead of rivetting, and shipbuilders have been offered bonuses for the discovery of the best methods of effecting this, and of securing other economies in weight. It is hoped to have 5-inch armour on the new cruisers, as compared with the 3-inch armour on the side of the "Salt Lake City."

If the 6-inch cruiser tonnage allowed by Treaty is used, adds the correspondent, ships of 10,000 tons will be built carrying twelve 6-inch guns. The elevation is to be increased from 22 to 40 degrees, which will increase the range of the 105-lb. projectile from 10 to 16 miles. At present, it is not thought likely that any 6-inch cruisers will be constructed before 1935.

CRUISER FLAGSHIPS.—The cruiser "Houston" has been assigned to be flagship of the Commander-in-Chief, Asiatic Fleet. The "Pittsburgh," now so employed, is to be disposed of. The "Salt Lake City" and "Pensacola" have been tentatively assigned to the Second and Third Light Cruiser Divisions, Scouting Fleet. The "Northampton," on returning from a shakedown cruise to the Mediterranean about 14th September, will become flagship of the Light Cruiser Divisions, in succession to the "Detroit."

CHANGES IN THE HIGHER COMMANDS.—The following were among the flag-appointments notified in May last: Admiral C. F. Hughes, C.N.O., to retired list; Admiral W. V. Pratt, from C.-in-C. Fleet, to C.N.O.; Rear-Admiral J. V. Chase from the General Board to C.-in-C., United States Fleet, with temporary rank of Admiral; Rear-Admiral S. H. Schofield, from command of the Battleship Division IV, to C.-in-C. Battlefleet, with temporary rank of Admiral.

ASSISTANT CHIEF OF NAVAL OPERATIONS.—A Bill to provide for an assistant to the C.N.O., was passed by Congress on the 23rd May.

PRESIDENTIAL REVIEW.—President Hoover carried out his first review of the United States Fleet off the Virginia Capes on 20th May. He went on board the new cruiser "Salt Lake City," which put to sea, and the entire Battle and Scouting Fleets steamed past the cruiser.

The air arm was well represented, for not only was the airship "Los Angeles" present, but a "Vought" observation plane from the "Saratoga" was attached to her as she hovered above the President's ship—the first time it was stated, that this feat had been performed above the ocean. The plane was later unhooked to drop into a gentle glide towards the flight deck of the carrier. Altogether, sixty-five planes took off from the "Saratoga" at intervals of, as a rule, from eight to fifteen seconds, and about as many went up from the "Lexington." Other planes were catapulted from battleships and from the "Salt Lake City."

NAVAL AIR SERVICE.

ENLISTED PILOTS.—The Navy Department wishes to amend the Act which states that a minimum of 30 per cent. of the pilots in the Naval Air Service must be enlisted men. Experience up to the present has shown that a ration of 21 per cent. of enlisted men to officer pilots best meets requirements.

ARMY NOTES

HOME

APPOINTMENTS AND PROMOTIONS.—H.M. the King has been pleased to approve of the appointment of General Sir Charles H. Harington, G.B.E., K.C.B., D.S.O., D.C.L., Colonel The King's (Liverpool) Regiment, Colonel Commandant, Army Educational Corps, as Aide-de-Camp General to the King; of Colonel (temporary Brigadier) H. Karslake, C.B., C.M.G., D.S.O., and Colonel (temporary Brigadier) W. A. Blake, C.M.G., D.S.O., as Aides-de-Camp to the King.

H.M. the King has been pleased to approve of the appointment of Major-General J. W. D. Megaw, C.I.E., M.B., Honorary Surgeon to the Viceroy of India, Indian Medical Service, as Honorary Physician to the King; of Major-General William Richard Blackwell, C.M.G., late Royal Army Medical Corps, as Honorary Surgeon to the King; and of Lieutenant-Colonel F. D. G. Howell, D.S.O., M.C., Royal Army Medical Corps, as Honorary Surgeon to the King, with his promotion to Brevet Colonel.

H.M. the King has been pleased to approve of the appointment of Major-General F. F. Ready, C.B., C.S.I., C.M.G., D.S.O., as Colonel of The Royal Berkshire Regiment, in succession to Major-General E. T. Dickson; of Major-General Sir Reginald Ford, K.C.M.G., C.B., D.S.O., retired pay, as Colonel Commandant, Royal Army Service Corps, in succession to Major-General Sir Frederick Landon, K.C.M.G., C.B.; and of His Majesty Haakon VII, King of Norway, K.G., G.C.B., G.C.V.O., as Honorary Colonel of the 108th (Suffolk and Norfolk Yeomanry) Field Brigade, Royal Artillery, Territorial Army.

THE WAR OFFICE.

Major the Lord Marley, D.S.C., late Royal Marines, *p.s.c.*, has been appointed Parliamentary Under-Secretary of State for War in place of the Earl of De la Warr, appointed Parliamentary Under-Secretary of State, Board of Agriculture and Fisheries.

Major-General George Sidney Clive, C.B., C.M.G., D.S.O., Director of Personal Services, the War Office, has been appointed Military Secretary to the Secretary of State for War, in succession to the late Major-General Sir Gerald Boyd, K.C.B., C.M.G., D.S.O., D.C.M. Major-General Clive has been succeeded as Director of Personal Services by Major-General Charles Parker Deedes, C.B., C.M.G., D.S.O., from Commander of the 53rd (Welsh) Division, Territorial Army.

The following appointments and promotions have been announced:—

Major-General C. J. C. Grant, C.B., D.S.O. has assumed command of the 53rd (Welsh) Division, T.A.

Major-General C. R. Newman, C.B., C.M.G., D.S.O., has been appointed Commander of a District in India, with effect from October 18th next.

Major-General A. E. W. Harman, C.B., D.S.O., has been appointed Commander, 1st Division, vice Major-General F. F. Ready, C.B., C.S.I., C.M.G., D.S.O., with effect from November next.

Colonel H. de C. Martelli, C.B., D.S.O., A.D.C., whose promotion to the rank of Major-General has recently been approved, has been selected for the post of Major-General in Charge of Administration, Southern Command, and will take up the appointment in November next.

Major-General R. D. F. Oldman, C.B., C.M.G., D.S.O., has been appointed Commander, 47th (2nd London) Division, Territorial Army, with effect from January 1st, 1931.

Major-General H. L. Pritchard, C.B., C.M.G., D.S.O., has been appointed Commandant School of Military Engineering, Chatham, with effect from February, 1931.

Colonel Henry Charles Rupert Hime, D.S.O., M.B., late R.A.M.C., has been promoted to the rank of Major-General, vice Major-General R. S. Hannay, C.B., C.M.G., D.S.O., K.H.S., late R.A.M.C., who has been placed on retired pay.

APPOINTMENT OF HONORARY CHAPLAIN TO THE KING.—His Majesty the King has been pleased to approve of the appointment of the Reverend George Standing, D.S.O., M.C., Deputy Chaplain-General to the Forces, as Honorary Chaplain to the King in succession to the Reverend J. D. S. Parry-Evans, C.M.G., C.B.E., Chaplain to the Forces, 1st Class (retired), Chaplain Commandant, Royal Army Chaplains' Department.

The appointment is made under the terms of the Royal Warrant which allows six Honorary Chaplains to His Majesty from the ranks of the most meritorious Chaplains serving in the first class of the Royal Army Chaplains' Department.

Mr. Standing is a Primitive Methodist minister and as such " Travelled " at Chipping Norton, Ventnor, Bournemouth, Reading and Aldershot, where he went in 1900. In October, 1914, he was given a Commission in the Chaplains' Department in the Army and has continued to serve as such as one of the representatives of the United Board. He rendered distinguished service in the Great War. He was appointed Deputy Chaplain-General at the War Office in January, 1929.

THE ROYAL ARMY CHAPLAINS' DEPARTMENT. NEW INSIGNIA AND MOTTO.—The King has approved of the Royal Army Chaplains' Department being permitted to adopt the motto: " In This Sign Conquer," and to embody this motto in the badges and insignia of the Department, new designs of which have also been approved. Details of the new designs are as follows:—

Embroidered Badges on Scarf.—Upon an oval wreath of laurel and oak, in gold, the Cross in silver edged with a scarlet line. In the centre of the Cross upon a blue ground, a circle of gold with the motto: " In This Sign Conquer "; within the Circle a quatrefoil voided. The whole ensigned by the Imperial Crown. For the Territorial Army the letter "T" in gold, edged with a scarlet line placed below the badge.

Badges for Uniform.—Upon a wreath of laurel and oak, in gilt, a Maltese Cross (8 points) in silver. In the centre of the Cross a circle in gilt on a blue enamel ground with the motto " In This Sign Conquer " pierced: within the circle a quatrefoil voided. The whole ensigned by the Imperial Crown in gilt. (For the Service dress cap and jacket the badges will be in black metal).

Buttons.—Upon a wreath of laurel and oak, a Maltese Cross; in the centre of the Cross a circle with a quatrefoil voided within. Superimposed within the top division of the Cross, the Imperial Crown.

Officiating Chaplain's Badge.—The badge is in the form of a brooch. Upon an oval wreath in laurel and oak, in gilt, the Cross in silver. In the centre of the Cross a circle in gilt on a blue enamel ground, with the motto: " In This Sign Conquer " pierced; within the circle a quatrefoil voided. The whole ensigned by the Imperial Crown in gilt.

PROMOTION BY BREVET.—The following Amendments to the Royal Warrant have been issued :—

180A. Except in the case of an officer of Our Royal Army Chaplains' Department, a captain after at least six years' service, a major or a lieutenant-colonel may be promoted to the next higher rank by brevet for distinguished service in the field, or for meritorious or distinguished service of an exceptional nature other than in the field. If the officer dies before the date on which the notification of his promotion for distinguished service in the field appears in the *London Gazette* the promotion shall bear the date which it would have borne had the officer not died.

180B. A major, other than a medical or veterinary officer, of Our Household Cavalry may be promoted to the brevet rank of lieutenant-colonel on becoming the senior combatant major in a regiment of Our Household Cavalry provided that there is only one lieutenant-colonel in the regiment.

180C. An officer holding the rank of lieutenant-colonel may be promoted to the brevet rank of colonel on appointment as Aide-de-Camp to Us.

180D. On appointment as one of Our Honorary Physicians or Honorary Surgeons an officer under the rank of colonel in Our Royal Army Medical Corps may be promoted to the brevet rank of colonel.

THE KING OF SPAIN AT SANDHURST.—Field-Marshal His Majesty the King of Spain, K.G., G.C.V.O., visited the Royal Military College on July 7th. In the morning he began by visiting the Staff College, where he lunched. He then proceeded to Sandhurst, where he arrived at 2 p.m., and was received by Major-General E. S. Girdwood, C.B., C.M.G., the Commandant.

He first visited No. 1, The Terrace, which was the residence of His Majesty's father during the time that Alfonso XII was a cadet at the Royal Military College. He then inspected the battalion in line. After the march past, he proceeded to the War Memorial Chapel, the library, the reading rooms and the dining rooms, before meeting the Company Officers in the officers' room.

TECHNICAL CAREERS FOR BOYS.—It is stated that over 2,000 boys are now being trained at Chepstow, Gosport, Catterick, Woolwich and other Centres for technical work in the Regular Army. Next September there will be vacancies for approximately two hundred and twenty more. Candidates must be between the ages of 14 years and 15 years 5 months on 1st September, 1930, except those for training as Bricklayers, who must be between the ages of 15 years 8 months and 16 years 4 months on that date. They will be selected by competitive examination. Successful candidates will spend three or four years in learning one or other of a variety of such trades, as artificer, armourer, blacksmith, bricklayer, carpenter, draughtsman, electrician, fitter, signal operator and surveyor. During their apprenticeship the boys will be maintained free of cost to their parents, and in addition, will receive pay and liberal holidays.

The booklet " Careers for Boys " containing full particulars may be obtained free, together with forms of application and specimen examination papers from the nearest Recruiting Office or from the War Office.

TERRITORIAL ARMY

The latest returns show that in May 4,588 recruits were finally approved for service in the Territorial Army, an increase of 1,065 over the number approved in April last, and 48 more than in May, 1929.

The total number of enlistments during the eight months of the present recruiting year was 20,138, compared with 19,486 during the corresponding period last year. Last month the Western Command led the way with 1,304 recruits, followed by the Northern Command, 1,220; Scottish Command, 770; Southern Command, 472; Eastern Command, 468; and London District, 354. The total Territorial strength, exclusive of permanent staff, is now 6,727 officers and 129,022 other ranks; this is an increase of 26 officers compared with the number a year ago, but the strength of other ranks is 2,091 less than on 1st June, 1929.

DOMINION FORCES

REGIMENTAL ALLIANCES.—H.M. the King has approved of the following alliances:—

The Auckland Mounted Rifles, New Zealand Military Forces, to the 3rd The King's Own Hussars;

10th Infantry (Witwatersrand Rifles), Active Citizen Force, Union Defence Forces, to The Cameronians (Scottish Rifles);

17th Battalion, Australian Infantry, Australian Military Forces, to The East Surrey Regiment;

1st/21st Light Horse Regiment, Australian Military Forces, to the 1st King's Dragoon Guards;

22nd Battalion, Australian Infantry, Australian Military Forces, to The Cheshire Regiment;

28th Battalion, Australian Infantry, Australian Military Forces, to The Gloucestershire Regiment;

40th Battalion, Australian Infantry, Australian Military Forces, to The Prince of Wales's Volunteers (South Lancashire);

5th Battalion, Australian Infantry, Australian Military Forces, to The Gordon Highlanders.

THE KING'S MEDAL FOR 1929.—The medal with clasp "1929" for the champion shot of the Military Forces of the Union of South Africa has been won by No. 1065, R. E. Neville, Durban and Coast Defence Rifle Association.

The clasp "1929" for the champion shot of the Military Forces of Canada has been won by Lieutenant D. T. Burke, The Governor-General's Foot Guards. The medal was won by this officer in 1925 and the clasp in 1927.

The clasp "1929" for the champion shot of the Military Forces in India has been won by No. 5313, Naik Barna Sing Thapa, 2nd Battalion, 2nd King Edward's Own Gurkha Rifles. The medal was won by this non-commissioned officer in 1928.

AUSTRALIA

NEW CHIEF OF THE GENERAL STAFF.—Major-General W. A. Coxen, C.B., C.M.G., D.S.O., the present Quartermaster-General, has been selected as Chief of the General Staff, Australian Military Forces, in place of General Sir Henry Chauvel, G.C.M.G., K.C.B., who has been C.G.S. since June, 1923. Sir Henry Chauvel was also Inspector-General. The latter appointment will remain in abeyance for the present. Brigadier C. H. Brand, C.B., C.M.G., C.V.O., D.S.O., 2nd Chief of the General Staff, will succeed General Coxen as Quartermaster-General. No successor has been appointed to Brigadier Brand as 2nd Chief of the General Staff.

Major-General Coxen, who is 60 years of age, is an artillery expert, and has served with artillery since his first commission in the Queensland Militia Garrison Artillery in 1893. In 1895 he was gazetted in the Permanent Artillery (Queensland) as a Lieutenant. He was then specially selected for training at Woolwich. After his return he was employed successively as Chief Instructor, School of Gunnery; Inspector of Ordnance and Ammunition; and Director of Artillery, Army Headquarters.

Early in August, 1914, he was promoted Lieutenant-Colonel and appointed Inspector of Coast Defences, which post he held until May, 1915, when he took over command of the 36th Heavy Artillery Group, A.I.F. In January, 1917, he became C.R.A., 1st Australian Division, A.I.F., in France, and in the following October took up the appointment of G.O.C., R.A., Australian Army Corps, A.I.F., which he held until the end of the war. After the Armistice he became Director of Ordnance Department, Repatriation and Demobilisation Department, A.I.F., and in August, 1919, was appointed Chief of Ordnance and 4th Military Member of the Military Board, Australian Army Headquarters. In April, 1920, he was appointed Deputy Quartermaster-General, and a year later became Colonel on the General Staff and Chief of Artillery. He was officiating 2nd C.G.S. from November, 1923, to December, 1924, and held the appointment of temporary Adjutant-General and 2nd Military Member of the Military Board from January to May, 1927.

At the beginning of 1925 he was appointed Quartermaster-General and 3rd Military Member of the Military Board, and also President of the War Railway Council. In his capacity of Q.M.G.—there being no Master-General of Ordnance on the Australian General Staff—he was responsible for all matters connected with the mechanization of the Australian Military Forces, for which task his technical knowledge specially fitted him.

INDIAN TERRITORIAL FORCE

BRITISH INSTRUCTORS.—The Secretary of State for India has approved of the proposal that British officers of the Indian Army may be employed with battalions of the Indian Territorial Force when embodied for training or service. The total number of officers so employed, excluding permanent Adjutants or administrative Commandants, shall not exceed 84. These officers will be seconded, and when not actually employed with their Territorial Force units, will be attached to Regular units of the Indian Army as the exigencies of service may demand from time to time. The conditions of service will be as follows:—a three years' tour of duty; regimental pay and allowances, and command pay in the case of commanding a territorial battalion, staff will also be admissible.

FOREIGN

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BELGIUM

MACHINE-GUN BATTALIONS.—By an amendment to the *Règlement sur les Attributions des Autorités Militaires*, the machine-gun battalions and infantry batteries in a division have ceased to be under the orders of the commander of the divisional infantry, and have been placed under the orders of the commanders of their respective infantry regiments. The General Staff states that this is not a mere amendment, but a change of policy.

COMMANDER OF DIVISIONAL INFANTRY.—The commander of the divisional infantry has recently been deprived of his staff, and has, therefore, ceased to be an echelon in the chain of command, being turned into an assistant of the divisional commander. This is equivalent to a step away from the French organization in the direction of the British.

UNIFORM.—A commission, appointed by the Minister of National Defence, having recommended the adoption of a dark blue uniform for wear by officers on ceremonial occasions, a referendum was held among the officers of the army. According to the press the result of the referendum was favourable to the adoption of such a uniform.

GRAND MANŒUVRES.—On 13th February the Minister of National Defence, replying to a question, stated that there was no intention of holding grand manœuvres in 1930.

BULGARIA

MILITARY SCHOOL, SOFIA.—This school trains officers for all arms of the Service. The staff is composed of officers from the different arms, each company being commanded by a lieutenant-colonel and each platoon by a major or captain. Non-commissioned officers are not employed as instructors.

The course lasts three years, the first year being taken up by general military instruction. In the second and third years the cadets specialize according to the different arms of the Service to which they are to be posted. Under the present system cadets who show skill in mathematics go to the artillery or engineers, priority of choice being given to those who obtain the greatest number of marks on their first year's work.

The cadets are generally of very good physique and above the average in height. They seem to be self-reliant and keen on their work. The inculcation of patriotism, discipline and other military virtues receives considerable attention, and the passages and rooms are hung with battle pictures showing scenes from the country's history, and with portraits of national heroes. In the dormitories are numbers of texts extolling the different military qualities.

The instruction is given up almost entirely to military subjects, and is mostly practical. Generally speaking, indoor work is carried out in the morning, consisting chiefly of topography, tactics and model bridge building. The French and German languages are also taught. Practical instruction includes ceremonial drill, musketry, weapon training and machine gun drill and, for cadets of the appropriate arms, gun drill, horsemanship and survey.

The school itself is located in one of the finest buildings in Sofia; the class rooms are large, the dormitories are bright and airy and are kept very clean and tidy. There are two libraries and a museum. Generally speaking, this may be considered as a very efficient institution well calculated to maintain Bulgaria's military traditions.

FRANCE

RESTORATION OF THE "KÉPI."—The *képi* has been re-established for general wear in the Army in peace time; it will be identical in shape for all arms and ranks. Ranks will be distinguished by the nature of the material, chinstrap and peak; arms by the colour, which will be that of pre-war days for all professional soldiers. For all non-commissioned officers and men of the annual contingent it will be blue for troops clothed in blue, khaki for those in khaki. Troops of the

annual contingent now wearing the *béret* or *chéchia* will continue to do so, but professional soldiers of such units will receive the *képi*.

The *bonnet de police* is retained for use on manœuvres and at daily work.

ARMY MANŒUVRES.—Manœuvres on a larger scale than those held for several years are to be carried out in Lorraine in September, under the direction of General Brécard, Military Governor of Strasbourg. They will take place between the Meurthe and the Sarre, and the following troops will be included, strengthened by reservists :—

Corps Headquarters	7th and 20th Regions.
Infantry Divisions	11th (Nancy).
	14th (Mulhouse).
	43rd (Strasbourg).
	2nd North African (Toul).
Cavalry Divisions	3rd (Lunéville).
	5th (Lyon).
Army Troops	Aviation units.
	Heavy artillery.
	Tanks and Engineer units.

An inter-divisional exercise will be carried out in the 6th Region (Metz), probably at the end of August, to study the air defence of the territory. This will be directed by General Lacapelle, Military Governor of Metz.

TRAINING CAMPS FOR THE ARMY.—The " rapport " of the Senate on the 1930 French Military Budget gives some interesting information regarding training camps for the army.

The army programme of instruction comprises, *inter alia* :—

(*a*) A period of 40 days for all active troops in camp yearly ; 75 days for Alpine troops.

(*b*) Combined training with air formations for certain elements.

(*c*) Divisional and other exercises, anti-aircraft training, combined training with the navy, and manœuvres.

This instruction is to be given in 27 camps (12 large and 15 small) as far as France is concerned.

Each camp must contain four or five infantry ranges, three or four artillery ranges.

Each must have a minimum area of 15,000 acres, and be suitable for containing 7,000 to 10,000 men under permanent buildings.

The smaller camps require a minimum area of 7,500 acres, to lodge 3,000 men, and to hold one infantry regiment, one group artillery, one company tanks.

Five divisional camps are also foreseen for Algeria.

The first echelon of work, to be completed by 1932, will cost 300 million francs and lodge 85,000 men ; this is needed for the annual reserve training of the 350,000 men required by the Law of Recruiting.

One-hundred-and-forty-six million francs of credit has allowed for the construction of accommodation for some 25,000 all ranks and the general structure of the camps and their necessary installations.

FRENCH NORTH AFRICA

SECURITY OF COMMUNICATIONS.—The following notes are extracted from the Senate Finance Commission " rapport " on the organization of security of communications in the Southern Territories of Algeria, Tunisia and the Sahara.

The only routes needing protection are :—

(*a*) Colomb-Béchar—Beni Abbès—Adrar—Tessalit.

(*b*) Médenine—Fort Saint—Fort Polignac—Djanet.

(*a*) Lies in the Ain-Sefra territory, and movement takes place by protected convoys, consisting of the *makhzen* of Colomb-Béchar, two sections of armoured cars (White and Panhard), and partisans of the Saoura. Further protection is afforded by the Saharan company of Bou-Denib on the Hammada du Guir, and to the south on the Rio de Oro frontier by the Saoura and Touat Saharan companies.

(*b*) Protection is assured by the S. Tunisian *makhzen* in Tunisia, and in Algeria by the El Oued mobile group, and the Saharan company of the Ajjer.

Until early in 1929, all M.T. vehicles used in the Sahara were for transport purposes only. Owing to incidents at the end of 1928, eight armoured cars were sent over, viz. :—four Whites and four 16 h.p. Renaults. The armoured car detachment at Colomb-Béchar will now be replaced by a motorized squadron of the Foreign Legion : vehicle 16 h.p. Berliet with four driving wheels, ten of these vehicles will be completely armoured and used as armoured cars, and six will be used for reconnaissance or transport of personnel.

Each of the groups of Saharan companies at Colomb-Béchar and Ouargla has also an M.T. section of a mixed nature (mostly experimental matériel), but new vehicles are on order : Citroen 15 h.p. and Laffly specially constructed lorries.

In Tunisia there is a squadron of armoured cars consisting of five White and six Renault cars as used in France.

As regards transmission matériel, all Saharan posts have a long wave wireless installation. The Saharan companies also possess two vehicles and six camel transport short wave posts.

The Senate Finance Commission criticizes the poor arrangements hitherto made as regards the provision of suitable and sufficient vehicles in these areas. It approves of the new organization by which the Ain-Sefra military territory now comprises all the area in Southern Algeria and Morocco subject to raids, with headquarters at Bou-Denib. The Commission very rightly insists that whether the troops concerned are under Algerian or Moroccan administration (as opposed to command), they must be treated exactly alike as regards pay, allowances, leave, etc., which has not been the case hitherto.

GERMANY

Collective Training, 1930.—The *Reichswehr* manœuvres will take place from 15th to 19th September on the borders of Thuringia and Bavaria near Meiningen, under the direction of General Heye, Chief of the Army Directorate, and will conclude with a review before President Hindenburg. The formations taking part will be Headquarters of 1st and 2nd Group Commands, 5th Infantry Division and 3rd Cavalry Division with attached troops, and in addition all other divisions will be represented in skeleton. The area consists of undulating and fairly wooded country. The manœuvres are specially intended to test command and leadership in the higher formations, staff work, and the system of communication and liaison, in which respects they will be on a larger scale than has been attempted since the war. The cost allowed for in the Budget estimates is £190,000.

GREECE

Strength of the Army.—For several years past Greece has pursued a policy of cultivating friendly relations with her neighbours, and economizing on national defence. Last year it became evident that this economy was beginning to cause

uneasiness amongst those responsible for the efficiency of the fighting forces, and the resignation last summer of General Manettas, the Under-Secretary of State for War, was generally regarded as a protest against the Government policy.

Recently matters have been brought to a head by the publication in January of an article in a Greek weekly journal by General A. Mazarakis, Chief of the General Staff, complaining that the Army had not been supplied for several years with the material necessary to its efficiency. Whether or not the publication of this article was approved by the Minister for War is doubtful, and there was apparently some misunderstanding between him and the Chief of the General Staff on the subject.

The question was then raised in Parliament and a debate ensued in the course of which the Premier, M. Venizelos, replied in detail to some of the criticisms in General Mazarakis' article. He declared his conviction that though peace was assured for ten years, nevertheless he could not admit that for that reason Greece should cease to maintain her army. The League of Nations based its strength on the forces of the States of which it was composed, and Greece, said M. Venizelos, would contribute to the peace of the world by maintaining an army adequate to her responsibilities in the family of nations.

SPAIN

RE-ORGANIZATION OF THE ARMY MINISTRY.—A Royal Decree of 22nd April gave the details of the re-organization of the above Ministry, which had been under consideration for some months.

(*a*) The Ministry is now sub-divided into two main Directorates :—

(1) The Department of Under-Secretary (*Subsecretaria*).

(2) The Directorate of Preparation for War.

(*b*) By the above subdivision, the Directorate of Military Industry is abolished, and the personnel and duties of this branch are transferred to the newly-created 5th Section of the Directorate of Preparation for War.

(*c*) The Directorate of Training and Administration automatically disappeared in February, on the re-introduction of the Under-Secretary's Department, and the majority of the sections formerly under this Directorate are now transferred to the control of the Under-Secretary.

TANGIER

REDUCTION IN NUMBERS OF THE GENDARMERIE.—The numbers of the gendarmerie have been reduced to 250 men.

Two budgets were produced for the gendarmerie at the end of last year, one for the first period of four months of 1929, during which the force was to number 400 men, the other for the remaining period of eight months, when the number of the force was to be reduced to 250. The first budget was duly voted and published, but the acceptance of the second budget was made dependent on an assurance being obtained from the French and Spanish Governments that they would bear the additional cost in excess of the sum for which they are liable under the terms of the Proctocol. The cost of the 250 men was estimated at frs. 1,693,528.22, of which the Zone is liable for frs. 1,000,000, and the French and Spanish Governments each to two-thirds of the sum of frs. 350,000, which each undertook to contribute annually.

When the matter came before the Committee of Control, the French and Spanish Governments were asked whether they were prepared to undertake this liability. Replies have been received stating that both Governments are prepared to increase their contributions if necessary up to frs. 346,764.11.

AIR NOTES

ROYAL AIR FORCE

Appointments.

Air Vice-Marshals.—Sir John Miles Steel, K.B.E., C.B., C.M.G., to be Air Officer Commanding the Royal Air Force, India, *vice* Air Vice-Marshal Sir W. G. Salmond, K.C.B., K.C.M.G., D.S.O., *p.s.c.*; Air Vice-Marshal C. L. N. Newall, C.B., C.M.G., C.B.E., A.M., Director of Operations and Intelligence and Deputy Chief of the Air Staff, to be Air Officer Commanding the Wessex Bombing Area *vice* Air Vice-Marshal Sir John Steel, in February, 1931.

Air Commodore.—A. G. Board, C.M.G., D.S.O., to Headquarters, R.A.F., Middle East, 25th February; on completion of temporary duty with Cape-Cairo Flight (1930).

Group Captains.—A. Fletcher, C.M.G., C.B.E., M.C., to Half-pay List, 7th April; on relinquishing appointment as Deputy Director of Organization. H. M. Cave-Browne-Cave, D.S.O., D.F.C., to Headquarters, Far East Command, 1st January; on appointment as Officer Commanding. C. D. Breese, A.F.C., to Headquarters, Iraq Command, 11th April; for Engineer Staff duties. G. I. Carmichael, D.S.O., A.F.C., to Headquarters, Iraq Command, 2nd March; supernumerary for special duty. R. E. C. Peirse, D.S.O., A.F.C., to Headquarters, R.A.F., Transjordan and Palestine, 12th March; attached for special duty. R. H. Verney, O.B.E., to R.A.F. Depot (I. Area), 22nd March; supernumerary, on transfer to Home Establishment. L. A. Pattinson, D.S.O., M.C., D.F.C., to Air Ministry (D.O.S.D.), 7th May; on appointment as Deputy-Director of Organization. H. L. Reilly, D.S.O., to R.A.F. Depot (I. Area), 17th March; supernumerary whilst attending Senior Officers' War Course at Royal Naval War College, Greenwich. E. M. Murray, D.S.O., M.C., to Station Headquarters, Heliopolis, 29th March; on appointment as Officer Commanding.

Personnel.

Flying Training.—During the period 1st March, 1930, to 31st May, 1930, the following completed Courses at Flying Training Units:—

	Officers.	*Airmen.*
Central Flying School (Flying Instructors' Course)	22	3
No. 3 Flying Training School ..	28	5
No. 5 Flying Training School ..	2	—

Map Reading Competition for the Sassoon Cup.—The final tests for the Sassoon Cup were carried out on the 27th March, with the following results:—

1st	No. 29 (F) Squadron	100%
2nd	No. 43 (F) Squadron	97%
3rd	No. 32 (F) Squadron	94%
4th	No. 56 (F) Squadron	92%

R.A.F. Display, Middle East.—The Annual R.A.F. Display in Egypt was held at Heliopolis Aerodrome (Cairo) on 3rd March.

The Display was honoured by the attendance of H.M. King Fuad, His Excellency the High Commissioner, and the heads of all diplomatic missions in Egypt. It was also witnessed by a large number of spectators.

NAVAL CO-OPERATION.

(*See* NAVY NOTES, *page* 625).

ARMY CO-OPERATION.

During March and April individual training and the annual practice camps took place. The time devoted to air firing has been approximately doubled this year, with a corresponding improvement in the results obtained.

Officers from the Staff College, Camberley, have been attached to Army Co-operation Squadrons during May, in order to obtain practical R.A.F. experience.

The usual R.A. practice camps opened in May, and the squadrons co-operated with the artillery formations to which they are affiliated. A detachment of the School of Balloon Training is stationed at Trawsfyndd to provide observation this year, since no aeroplane landing ground is available. The Night-Flying Flight is at Weston Zoyland, in order to tow targets for the A.A. Practice Camp, Watchett.

Tests of mobilization equipment have been carried out by No. 13 (A.C.) Squadron, in order to make a more prolonged trial than was possible in the short time available last autumn.

A number of army staff exercises have been held in which R.A.F. staff officers have taken part.

OVERSEAS COMMANDS

INDIA

During April serious disturbances broke out on the North-West Frontier. Anti-Government feeling, actuated by hostile propaganda, appeared to be accountable for the general unrest amongst the tribes, particularly in the Mohmand country and the Peshawar district. As a result of the unrest in these localities, a number of reconnaissances by aircraft of No. 20 (A.C.) Squadron were carried out, during which the aircraft were heavily fired on on several occasions while over Mohmand country. The situation for a time improved until early in May, when the continued presence of the Haji of Turangzai near Shabkadr on the Mohmand border caused the Government to issue a warning to him to remove himself and his lashkar under pain of air action. The warning was ignored, and aircraft of Nos. 20 and 27 Squadrons accordingly took offensive action, forcing the Haji and his Bajaurs to vacate their caves. Several small parties were observed by air reconnaissances moving in a northerly direction to Bajaur. He was later reported to be in hiding in the Darba Khel and Ghalanai district. Harassing tactics by the aircraft were maintained, and his positions subjected to air action on every occasion when targets presented themselves. By continually patrolling the area, the aircraft succeeded in effectively blockading his position, thus preventing the lashkar from assembling and attempting hostile action. By the end of June the Haji's resistance was completely broken, and his lashkar dispersed. The Haji has returned to Lakarai, and the Mohmand country is now quiet.

Following an attack on the Datta Khel post in May by a lashkar of Wazirs numbering 500, air action was taken against them by the flight at Miranshah. As the lashkar failed to disperse, the villages of Datta Khel were subjected to air action after the usual warning notices had been dropped. The result of the air action was immediate. The hostile lashkar dispersed, and the terms of our

ultimatum to the Maliks were complied with within seven hours of its expiration. The Maliks presented themselves at Miranshah as hostages.

In other districts aircraft have been very active in dispersing hostile lashkars. Several bodies of Afridis assembled in the Kajuri plain and crossed the border with the intention of attacking Peshawar. Continuous air action was taken against them, and the lashkars were driven back to the Bara Valley, suffering many casualties.

In Waziristan trouble with Shabi Khel lashkars has been experienced on two occasions. In the first instance the threat of air action was sufficient, and the lashkars, with the exception of one section, dispersed. The villages of the hostile section were subjected to air action, resulting in their destruction. The second instance occurred early in July, when a lashkar of Shaktu tribesmen, numbering 3,000, assembled, and with other hostile lashkars commenced to attack our posts and to destroy the bridges. As a result the lashkars and hostile villages of Shabi Khel were subjected to air action after due warning had been given. It is as yet (11th July) too early to determine the full effect of the air action taken, but one lashkar is reported to be dispersing and the threat of air action to other villages in this area has had a considerable moral effect on the tribes.

IRAQ

RAIDS BY THE ROWALLA.—During March a flight of No. 55 (B) Squadron was detached to Rutbah in order to co-operate with the Iraq Desert Police in the Wadian area, who were engaged in the recovery of loot taken from Iraqi tribes by the Rowalla. After one or two minor demonstrations of hostility on the part of the Rowalla, which were rendered abortive by the arrival of the aircraft, a patrol of police cars, accompanied by aircraft, visited the Rowalla camp, and impounded a sufficient number of camels to compensate the Iraqi tribes for the losses they had sustained. The impounded camels were driven to Rutbah, and handed over to the various claimants. Settlement of all outstanding claims between the Rowalla and Iraqi tribes has now been reached, and the former have returned to their normal grazing areas in Syrian territory.

REDUCTION OF FORCES.—A further reduction of two sections of Armoured Cars was effected on 1st April. In consequence of this reduction from six sections to four, the Armoured Car Wing has now been designated No. 1 Armoured Car Company.

PALESTINE

The situation in Palestine remains quiet. The bandit gangs in the Safed area continued to give trouble for a time, but as a result of the operations directed against them, the gangs have broken up and have now ceased to have any significance.

SUDAN

During April a certain amount of unrest was experienced in the region South of Malakal in the Upper Nile Province. A number of recalcitrant Gaweir Nuers had offered definite armed resistance to the Government tribal police, and had taken refuge on the lower Zeraf Island, between the rivers Zeraf and Jebel, in country inaccessible to ground troops. It was, therefore, decided to carry out an air reconnaissance of the affected area in order to locate the recalcitrants and to explore the possible approaches to their stronghold. Two aircraft of No. 47 (B) Squadron accordingly left Malakal and landed at Ajwong on 23rd April. Three

reconnaissances, covering the whole of the area, were undertaken. A number of small camps were observed but no large concentrations were visible, and most of the area appeared to be uninhabitable. The best method of gaining access to the island was carefully explored, and two possible points of entry from the East were observed, but access from Bahr-el-Jebel appeared to be extremely difficult. On the morning of the 24th April a demonstration by aircraft was made over the villages in the neighbourhood of Rufshendal, as these villages had been guilty of harbouring Pok, a much wanted Kajur. The demonstration was successful, and it was evident from their behaviour who were the guilty people. The reconnaissances undertaken revealed the fact that no difficulty is experienced in spotting even small concentrations of men in the swampy country in the Sudd area. As a result of the action taken it was decided to deal with the recalcitrants by the use of tribal police. The aircraft accordingly returned to Malakal on 26th April.

TRANSJORDAN

During March it became known that the Rowalla, a Syrian tribe, were in Transjordan territory on their annual northerly migration from Nejd, and were in possession of camels looted from Transjordan tribes. A small force, consisting of R.A.F. armoured cars and Transjordan Frontier Force, left Amman on 9th March. The Rowalla were located on 13th March, and as negotiations for the return of the looted camels proved unsatisfactory, a requisite number of camels were impounded and handed over to the civil authorities at Zerka for distribution to the tribes who had suffered in recent raids. Throughout the operations aircraft of No. 14 (B) Squadron carried out reconnaissances for the column, and Victoria aircraft from No. 216 (B) Squadron were employed as supply transport for the conveyance of the column's requirements.

Aircraft and armoured cars operating from Amman and Bair continue to patrol the southern and eastern frontiers of Transjordan. Successful operations have resulted in the interception of raiding parties, and the disposition of aircraft and armoured cars is proving a great deterrent to raiding by both Transjordan and Nejd tribes. All Transjordan tribes have now been withdrawn West of the line Bair—Jeffer—Tel Shahim, and with these greater distances and the continued action of aircraft and armoured cars it is hoped to minimise trans-frontier raiding.

Mr. M. S. MacDonnell has proceeded to Jeddah, in order to carry out an investigation and report upon outstanding claims in respect of past raids between the tribes of Transjordan and Nejd.

AVIATION IN FOREIGN COUNTRIES

FRANCE

THE BUDGET.—The 1930 Budget has finally passed without any serious modification at 2,024,852,020 francs. This time the financial year begins on the 1st of April; in the past it has conformed with the calendar year. Expenditure for the period between the end of the last financial year (31st December) and the beginning of the present year (1st April) was covered by voting a sum equal to one-quarter of the past year's expenditure.

It was revealed in the course of the Budget discussions that the new West African Squadron will eventually be stationed at Gao on the Niger, where it will be in a good position to render assistance to the France-Congo Air Line due to begin working this year. It has been definitely stated by the French Air Minister

that it is his policy to use Air Force units stationed in the Colonies to help on the civil air lines.

The work of getting ready the new air force station in Madagascar is progressing rapidly. The unit will probably consist of a squadron of general purpose aircraft, and should be ready to operate this year. The unit will be stationed at Antanarivo.

The France-South America Air Line have made their first mail flight across the South Atlantic. Mails were delivered at Buenos Aires three-and-a-half days after leaving France. The return flight will take place immediately and it is proposed that the service shall then be operated weekly. Up to now the central portion of the journey from France to Buenos Aires, which consists of the Atlantic crossing, has been carried out by French naval despatch boats lent by the Government.

AIR UNION LIGNE D'ORIENT.—In connection with the establishment of the air route between Damascus and Baghdad a series of experimental flights, using Breguet aircraft, were successfully carried out between December, 1929, and February, 1930. The Agreement governing the conditions under which the Iraq Government would sanction the operation of mail and passenger services was concluded in the first week in March.

The Damascus-Baghdad section of the Air Union Ligne d'Orient was opened on 2nd April. It now carries a weekly mail and such passengers as it can collect Two aircraft are in service.

GERMANY

AIR ESTIMATES, 1930–31.—The German Air Estimates for 1930–31 have been presented to the Budget Committee of the Reichstag, but are not yet passed. As drawn up they amount to a total of R.M. 45,977,550 (£2,298,880), compared with a total of R.M. 27,961,612 (£1,398,000) for last year. A supplementary estimate was, however, passed last year, bringing the amount to a total of R.M. 38,736,612 (£1,936,000).

The principal items in the Estimates are as stated below; for purposes of comparison, similar items of the previous financial year are given :—

	1930–1931 R.M.	1929–1930 R.M.
Technical Research and Development	5,445,000	14,505,000
Economic development of Aircraft Industry ..	7,000,000	—
Development of public air traffic by the Deutscher Luft Hansa :—		
(*a*) European lines	16,000,000	13,000,000
(*b*) Non-European lines	3,000,000	
Training of civil pilots	2,300,000	2,300,000
Development of lighter-than-air craft, including grants to the Zeppelin Co.	3,150,000	2,500,000

INTERNATIONAL FLIGHT ROUND EUROPE.—Germany entered, through the Aero Club of Germany, no less than thirty-one light aeroplanes for this competition. Among these entries are B.F.W., M.23 (b) and (c), Klemm L.25 and L.26V, Argus As 8, Phœnix L.2, Junkers Juniors, Arada L.2a, Albatross L.101, etc.

GREECE

THE AIR MINISTRY.—The recently created Greek Air Ministry is functioning smoothly under the Under-Secretary of State, M. Zannas.

Captain Voulgaris, who was Director of the Naval Air Service, has been appointed Chief of the Air Staff, and Wing-Commander (Acting Group-Captain) G. B. Dacre, D.S.O., R.A.F., who is a member of the British Naval Mission to Greece, has been appointed Air Adviser to the Air Ministry.

ITALY

RECORD FOR DISTANCE AND DURATION IN A CLOSED CIRCUIT.—After three previous attempts Italy has captured the world's record for distance and duration in a closed circuit. The aircraft used was a Savoia-Marchetti S.64 bis, fitted with a Fiat A.22 T. engine of 500 h.p., piloted by Commandante Maddelena and Lieutenant Cecconi. The flight commenced on 30th May, and was carried out over a circuit in the neighbourhood of Rome. The duration of the flight was 67 hours 15 minutes.

LONG-DISTANCE FLIGHTS.—Rumours of other long-distance flights have been current for some time, and it now appears that Italy intends to carry out three this year :—

(*a*) A flight of twelve S.55 flying boats to Brazil, which it is understood General Balbo intends to lead. The flight is to be carried out non-stop if possible.

(*b*) A flight to New York by Commandante Maddelena and Lieutenant Cecconi in the same aircraft as that which was used when they broke the record for distance and duration in a closed circuit.

(*c*) A flight to Australia by Francisco Lombardi in a Fiat light aeroplane.

AIR DISPLAY. An Air Display was held at the Littorio aerodrome, Rome, on 8th May. The programme of twelve events followed closely on the lines of the R.A.F. Annual Display, and was well carried out. The Display aroused great interest throughout Italy, and there was a large attendance of spectators. The profits of the Display are to go to the " Institute for Orphans of Aviators."

SIAM

The Siamese are making increasing use of aeroplanes to deal with the lack of other communications ; but there is no such thing as civil aviation in Siam, all transportation of mails, etc., being carried out by the Army Air Service.

The North Eastern part of the country has an area equal to about one-fifth of the whole kingdom, and comprises the Provinces of Nagorn-Rajasima and Udorn, with a population of about 3,200,000. In this area the chief means of transport is the bullock cart, owing to the lack of roads and railways, although Nagorn-Rajasima is connected to Bangkok, the capital, by rail, and extensions are being made to the railway towards the East and the North.

On account of these limited communications, the Postal Service is subject to delay, and no rapid transport for the sick requiring urgent medical attention is available by ordinary means. The Siamese Government, realising this, have established an aerodrome at Nagorn-Rajasima and three smaller ones at Roi-Et, Ubol and Udorn in 1922 and 1923.

At the present time there are two Air Mail lines in operation :—

(1) Nagorn-Rajasima—Roi-Et—Ubol (363 kilos).

(2) „ „ „ Udorn (431 kilos).

In addition to the ordinary aeroplanes used for the carriage of mails, ambulance aeroplanes are available for hire at the various stations to convey sick persons to Bangkok. Poor persons in the North Eastern Provinces are, in urgent cases, transported free of charge.

When the railway extension from Nagorn-Rajasima to Ubol is completed, the utility of the present air mail service between the two places via Roi-Et will be lessened. The Siamese Government have, therefore, decided to abolish this air route and to open a new one between Nagorn-Rajasima and Nagorn Bhanom via Roi-Et.

UNITED STATES OF AMERICA

Naval Aviation.

Following the Spring manœuvres earlier in the year, the three aircraft carriers, "Lexington," "Saratoga" and "Langley," accompanied the United States battle fleet on a visit to Hampton Roads and New York.

Early in May the naval aircraft squadrons carried out several long demonstration flights, during which Washington, New York, and many of the larger cities and towns near the coast were visited. Never before have fleet aircraft in such numbers been seen on the East coast, as the battle fleet is normally based at San Diego on the West coast.

It is reported that over 130 aircraft from the carriers took part in these flights, the distribution being approximately as follows :—

Carrier.	*Fighters.*	*Torpedo Bombers.*	**Light Bombers.*	*Scouting and Reconnaissance.*	*Amphibian and Transport.*	*Total.*
"Saratoga" ..	12	18	15	9	3	57
"Lexington" ..	18	18	15	9	1	61
"Langley" ..	9	—	—	6	—	15
Total ..	39	36	30	24	4	133

* Fighting aircraft classed as light bombers.

Army Air Corps.

Army Manœuvres on the West Coast.—The manœuvres took place on the West Coast in the southern part of the State of California during April, 1930. As far as the Air Corps was concerned, the major problems consisted of harassing the invading enemy advanced forces by destroying their lines of communication, etc., with the object of delaying the advance of the enemy main army until reinforcements could be brought up for the defence of San Francisco. Later in the manœuvres it was assumed that an enemy fleet was attempting to force the entrance to the Golden Gate off San Francisco, but a concentrated defence by aircraft defeated the enemy's object.

Several interesting features were brought out during the manœuvre period. The air forces engaged were assumed to be acting as an independent fighting force unsupported by organised ground troops. This was the first occasion on which all branches of the Air Corps were brought together for co-ordinated training, and it proved an invaluable opportunity to test the relative efficiency of all types of Service aircraft when operating together or in support of each other.

The number of aircraft operating totalled about 150, all types, and were flown from various parts of the States to the concentration station in California. Some excellent long-distance formation flights were carried out, among them being the following :—

(*a*) *The Fighting Group*, consisting of 40 fighting aircraft with 4 transport aircraft, flew together 4,300 miles, which included the flights to and from their home station at Selfridge Field.

(*b*) *The Bombing Group* of 19 twin-engined bombers and one transport, completed a total of 5,800 miles by the time the home station at Langley Field was reached.

(*c*) *The Attack Group* at Fort Crockett, Texas, consisting of 28 attack and one transport aircraft, flew together a total of 3,600 miles, while a mixed group, consisting of 20 fighters, 4 bombers and 2 transport aircraft, completed a 1,000 mile flight by the time they reached Rockwell Field, San Diego, their depot station.

The total mileage flown by all aircraft engaged in the manœuvres amounted to over 430,000, and was carried out without serious accident or delay.

According to the Press, the Air Corps authorities are particularly impressed by the successful way in which the air force was maintained by its transport aircraft. All supplies, including complete engines in their crates, were carried by this means. Forced landings occurred to two aircraft through engine failure, and new engines were flown out in the transports and installed by Air Corps mechanics, the damaged engines being conveyed by air to the concentration centre. A record of 97 per cent. operating efficiency was maintained throughout the manœuvre period, due, it is said, entirely to the success of the transport aircraft which were organized into transport squadrons.

It is reported that various new formations and tactics were tried out with success, among them being the following :—

(*a*) High formation flying—A squadron of fighters with full military load operated in formation at 25,000 ft.

(*b*) A squadron of bombing aircraft demonstrated an unusual formation, said to give greater defensive measures, and also allow the rear gunners of each aircraft to bring greater concentration of fire in support of aircraft behind. The formation consisted of a "V" of nine aircraft with the wide end of the formation closed by two of them. Instead of the aircraft being stepped up behind the leader in the usual way, each pair were lower than the pair in front, the leader being in the highest position of the formation.

(*c*) The Air Corps is said to have abandoned the method of attacking a bombing formation from below and to the rear, owing to the vulnerability of the attackers to gun fire from a formation such as that mentioned at (*b*) above.

Instead, a bombing formation is to be subjected to long-range harassing fire from fighters flying above and far to the rear, and at the same time diving attacks by fighters are to be delivered on the right and left front quarters of the bombing formation. It is claimed that this method of attack is much more effective than any other.

(*d*) The Air Corps has developed a special type of aeroplane for attacking ground forces, designated Attack aircraft. This type, a two-seater armed with six machine guns, operates at a height between 50 and 100 ft. from the ground, and follows as far as possible the contours of the country, which acts as cover. These aircraft were used during the manœuvres, not only for attacking lines of communication, etc., but also in connection with the convoying of bombing formations, the theory being that the Attack Squadrons could so harass enemy anti-aircraft fire as to render it ineffective. The bombers would also be escorted by high-flying fighting aircraft.

HIGH ALTITUDE PHOTOGRAPHY.—Captain W. A. Stevens of the U.S. Army Air Corps recently succeeded in taking a photograph covering 270 miles in a single exposure. The photograph was made during a flight at 20,000 ft. over Crater Lake, Oregon, and the result gives a remarkably clear picture of the various mountain ranges stretching away northward towards Mount Rainier, 14,000 ft. above the sea. The lens used in the camera, perfected by Captain Stevens for long-distance photography, is of a peculiar red, so deep in shade that to the naked eye the lens seems black. A special highly-sensitive film is used on these occasions.

AIRSHIP NOTES

GREAT BRITAIN.

"R.101."—The minor modifications and much of the preliminary work necessary before the new bay is inserted in "R.101" have now been completed. The airship has since carried out three short flights, including an appearance at the Royal Air Force Display, and has now been rehoused for the insertion of the new bay prior to the flight to India in the autumn.

On a recent bench test, one of the 585 h.p. Beardmore compression ignition engines from "R.101" ran successfully for 225 hours at full rating, including 50 hours' continuous running. As the normal time test for a Service petrol engine consists of 98 hours at nine-tenths full power and 2 hours at full power, this test must be regarded as very satisfactory.

"R.100."—Airship "R.100" resumed her flight trials on 21st May, and a flight of approximately 23 hours was carried out. Up to date this airship has flown 110 hours. The longest flight, so far, has been the endurance flight of approximately 54 hours, which was carried out during January, 1930.

At the end of the trial flight on the 21st May, it was discovered that the tail fairing piece, which is intended to improve the flow of air at the tail of the airship, was buckled, and subsequent inspection showed that in one of the bays behind a power car the force of the slipstream had damaged the cover and the securing wires and tapes. The tail fairing has been reconstructed in material of heavier gauge and with additional stiffening, and damage to the outer cover has been remedied by the insertion of intermediate girders in the affected bay.

On the 25th July, "R.100" set out from Cardington on a twenty-four hours' trial, preparatory to her flight to Canada. Passing over the Midlands she made Lundy Island and then came up Channel as far as the Isle of Wight, when she turned back, crossing to the neighbourhood of Cherbourg, and then heading for home, made the Channel Islands, Weymouth, Southampton, Portsmouth, London and so back to Bedford, covering in all a distance of approximately 1,200 miles.

Flight to Canada.

At about 3.30 on the morning of the 29th July, "R.100" left the mooring mast at Cardington for Canada. She arrived and moored to the mast at the St. Hubert Station, Montreal early in the morning of the 31st July, 79 hours after leaving Cardington.

On the night before her arrival, while heading up the St. Lawrence, the airship ran into a violent storm and was much buffetted about. Except for some damage to the fabric of her fins, "R.100" appears to have weathered the storm satisfactorily.

Throughout the flight the airship was in constant touch by wireless telegraphy with shore stations, and was materially assisted in choosing her course by the weather reports received.

"R.100" was commanded by Squadron-Leader R. S. Booth, A.F.C., who had already taken the ship out on her trial flight. Commander Sir Dennistoun Burney, R.N.; Wing Commander R. B. B. Colmore, Director of Airship Development; and Lieutenant-Commander R. St. J. Prentice, from H.M.S. "Courageous" and representing the Admiralty, were amongst those on board.

GERMANY

THE "GRAF ZEPPELIN'S" FLIGHTS.—Early on the morning of 26th April the German airship "Graf Zeppelin," under the command of Captain Lehmann, left Friedrichshafen for Cardington near Bedford. The airship crossed the English coast at Brighton about 3.15 p.m., proceeded to London and circled low over the Wembley Stadium, where the Association Football Cup Final was in progress, and landed at Cardington about 5.30 p.m. Dr. Eckener took over command of the airship when she left Cardington an hour later on her return journey. Friedrichshafen was reached at 6.45 a.m. the following day.

The airship left Friedrichshafen on the 18th May on a flight to South America. Dr. Eckener was in command, and she carried a crew of 42 and 22 passengers. She arrived at Seville on the evening of the 19th, and left there for Brazil at 8.30 a.m. on the 20th. Progress was at first slow, owing to South and South-westerly winds, but the Equator was crossed at 9 a.m. on the 22nd, and the airship reached Pernambuco at 6.30 p.m. on that day, having crossed the Atlantic in 59 hours 53 minutes. Before leaving for the United States a trip was made to Rio de Janeiro, a distance of 1,120 miles, and the airship started for Lakehurst, New Jersey, on the 28th, arriving on the 31st. During this flight she encountered what Dr. Eckener described as one of the worst storms ever known, and was so severely buffeted that two struts of the rear gondola were torn from their fastenings. She left Lakehurst on the return journey at 10 p.m., on the 2nd June, and arrived at Seville on the evening of the 5th, when after re-fuelling and re-gassing she left immediately for Germany, and reached Friedrichshafen on the 6th.

The log showed that between leaving Friedrichshafen on the 18th May and returning there the airship had completed a flight of 18,595 miles in 298 hours 32 minutes. This gives an average speed of 61 m.p.h.

UNITED STATES

NEW NAVAL AIRSHIP.—The first of the two rigid airships authorised in 1926, the "Z.R.S. 4," is building in Ohio, and is being named the "Akron." She is to be ready for trials in about July, 1931. In contrast with the British aim of developing a commercial airship, these two new United States vessels of 6,500,000 cubic feet capacity are designed essentially for naval reconnaissance. Instead of passengers they are each to carry in an external hangar five completely assembled aeroplanes. One is to be based on the East Coast and one on the West Coast.

AIRSHIP NEEDS.—Rear-Admiral Moffit recently outlined the needs of the United States Navy as regards airships. He emphasized the importance of establishing a new base on the Pacific coast, complete with hangar and mooring mast. He advocates additional masts at the Aleutian Islands, Alaska and Puget Sound, and notes that there is already a mooring mast at Hawaii. He states that two airships are necessary, one to be used for experimental development, while the other is operating with the fleet, but the second airship should embody the improvements found from the experience gained in completing the first one.

MOBILE MOORING MAST.—It is reported in the *Army and Navy Journal of Washington* that experiments have recently been carried out with a low or "stub" mooring mast only 60 feet in height, as opposed to some 200 feet, and capable of being moved about the ground. The naval airship "Los Angeles" was moored to this mast with a ground crew of only sixty instead of more than three times that number. The mast is telescopic, and can be adjusted to suit different airships.

It is placed on the centre of a mooring site and encircled by a standard gauge railway track, on which runs a specially devised car to which the tail of the airship is secured. The airship is, therefore, held at the nose and tail, but is able to swing to the wind. It is claimed that this system has the advantage that the vessel is moored nearer the ground, where the wind velocity is less, and where it can be conveniently reached for repairs. Being held so that it cannot move in a vertical plane, it does not have to be "flown" continuously as is the case when moored to a high mast.

If it is desired to dock the airship in its hangar, the mobile mooring mast gets under way and tows it in like a flag. The tail is released from its car and supported on a pneumatic wheel device and held down by a "tail drag."

AN ARMY AIRSHIP.—It is understood that a Bill has recently been introduced in the House of Representatives which will provide for a larger all-metal airship than that which the U.S. Navy Department is experimenting with at the present time.

Details available show that the airship will be 547½ ft. long, with a maximum width of 119½ ft. and a gas capacity of approximately 3,800,000 cu. ft. The cost will be in the neighbourhood of $4,500,000 (£900,000); eight engines will form the power plant, and will develop 4,800 h.p., giving an estimated maximum speed of 100 m.p.h.; the airship will weigh about 67½ tons, its useful load being estimated at nearly 90 tons.

It is to be equipped with 30,000 rounds of ammunition, one 37 m.m. gun, from 2 to 7 tons of bombs, 2 aircraft, 10 machine guns, and a 1,000-watt searchlight.

REVIEWS OF BOOKS

GENERAL.

Changing Conditions of Imperial Defence.
By Captain D. H. Cole M.B.E. (Sifton Praed & Co.). 6s. 6d.

The student who has already realised his indebtedness to Captain Cole for his "Imperial Military Geography" will find further cause for gratitude in the publication of this concise review of the many factors bearing on Imperial Defence.

British man power forms the subject of the opening chapters, and in it the author shows how the balance in numbers of the white population is changing from predominance in the Mother Country towards equality with the Empire overseas. Tactfully, but with the logic of irrefutable figures, he points to the overwhelming burden that Britain is bearing in her share of the cost of Imperial Defence generally and in expenditure on the Navy in particular, as compared with the cost per head of the Dominion contributions. "All the Dominions, except Canada, have a greater ship-borne trade per head of the population than Great Britain, yet they pay towards the defence of the Commonwealth of Nations amounts ranging from only one quarter to one-sixth of that paid by the people of Great Britain," is one significant observation.

Even making a comparison on the basis of tonnage owned, we find that the Dominions possess one-ninth of the shipping of the Empire, but they pay only one-twentieth of the total cost of sea defence. At the Imperial Conference of 1926, Mr. Bruce led the way in showing appreciation of this inequitable state of affairs; it is to be hoped that the position will receive further consideration at the forthcoming Conference.

The second chapter deals with the material resources of the Empire, and the extent to which supplies can be controlled through the medium of sea communications.

Subsequent chapters are concerned with the United States and Sea Power, the situation in the Mediterranean, Indian and Pacific Oceans, respectively. Lastly, the author reviews the world as he sees it to-day; a "shrinking world" as he calls it, "because with the development of air communications the most distant places are only a few days journey from each other instead of many weeks apart."

A brief but very realistic summary of recent efforts to ensure peace by Covenant and Pact, calls forth the remark that "the writer does not know of any great war in the last two centuries in which both sides did not claim that it had been thrust on them by the aggressiveness of the other, and the consequent need for defending themselves. "In fact," he adds, "the advice 'Don't think of war and don't prepare for war, and there will be no war' is highly idealistic. 'Don't think of burglary, don't prepare for burglary, and there will be no burglary; have lawyers, well codified laws, commodious and well-appointed Courts, but no policemen' is not an unfair parallel."

The whole tone of this excellent little book is so sane, so logical, and where opinions are expressed they are so well justified by the quotation of definite facts and figures, that it should be a timely antidote to much loose thinking, unpractical idealism and dangerous pacifism, as well as being invaluable to the student of Imperial Defence to-day.

The Real War: 1914-1918. By B. H. Liddell Hart. (Faber & Faber, Ltd.) 12s. 6d.

Even if this book cannot be regarded as a complete and detailed history of the Great War, there is little doubt that it provides the reader with an unusually clear survey of its many campaigns, while it brings to light in striking fashion the reactions of one theatre of war on another. Nevertheless, it is a trifle rash to state, as Captain Liddell Hart does in his preface, that "most of the possible documentary evidence on the war has now been published and is available for the student." Neither does it appear feasible for a single brain to be devoted to serious research among the archives of all the various belligerent powers. To collate many of the existing printed authorities is all that a solitary writer could be expected to do. This the author has done, and the outcome of his labours is a highly engrossing and stimulating work, which no student of the Great War should fail to read.

The arrangement of the book is distinctly clever. There are seven chapters which are each given a title, presumably taken from the language of the boxing ring; each chapter after giving a succinct yet interesting narrative of the events of the period is followed by a number of "scenes," each of which again expounds some critical event of the war. By these means Captain Liddell Hart succeeds in stressing, or in giving details of, only those parts of the struggle which he wishes to throw into higher relief. The result is thoroughly satisfactory.

It is in the critical review of the grand strategy and local strategy of the many campaigns that the chief merit of the book will be found. It may well be that many readers may not see eye to eye with the author. Some will say, perhaps rightly, that he does not allow sufficient weight to the huge "march casualties" that the Germans suffered during their advance to the Marne in 1914; and that these casualties coupled with supply difficulties and human fatigue may have contributed in no small share to the collapse of the German High Command at that battle. Again, it may be urged that he does not value sufficiently highly the casualties inflicted on the Germans during the Somme fighting and their repercussion on the High Command. These, and other objections to his presentation of the 1917 and 1918 campaigns in Flanders might be brought against him, but to some extent they must remain matters of opinion upon which it is more than difficult to adjudicate.

There is an Epilogue to the narrative which attributes the breakdown of Germany in 1918 mainly to the effects of the Naval Blockade. These few pages deserve to be read with care. There is no other summing up to the story; there are no "lessons." Perhaps it is as well, since the lessons are fairly obvious throughout the volume. The chief of these is the inadaptability of the professional military mind to meet the intellectual needs of modern war. Whether to agree or disagree with the author must be left to the reader to decide for himself, but we can at least say that he puts forward a very strong case.

There are certain lapses into journalistic phraseology which occasionally detract from the literary standard. This is all the more regrettable in an author whose facile pen can provide such admirable descriptions as those of the Gallipoli operations, amongst others. He has no need to gild the lily. Such blemishes, however, need not be regarded as detracting from the value of the work as a whole and the lessons it purports to provide.

Kitchener. By Brigadier-General C. R. Ballard, C.B., C.M.G. (Faber and Faber Ltd.). 18s.

General Ballard gives in a single volume a very readable account of the affairs in which Lord Kitchener played a leading part. But it is the skilfully accomplished

portrait of the Man which makes this biography so acceptable. The public love a mystery, and there was always something mysterious about " K." He undoubtedly caught the imagination of the people of our Empire, and their confidence in his power was an immeasurable asset when war came in 1914. From his earliest days his environment was very different from that of the ordinary soldier. He seemed to live a life apart, a man of few words and with a great power of concentration on any work in hand. The circumstances surrounding his work up to the finale of the reconquest of the Sudan led him to do everything himself, leaving as little as he could for others except within the narrow limits he laid down. General Ballard does not attempt to hide the defects which became engrained in a character formed under such conditions.

Space forbids comment on the author's account of Kitchener's services in South Africa and India, and we pass on to the very interesting chapters on the Great War to which nearly half the book is devoted. In the public mind, perhaps, Kitchener's greatest service seemed to be the creation of the New Armies. It will always be a matter of argument whether we lost or gained by their formation in preference to the expansion of the Territorial Army. It was one of the defects of his qualities to be indifferent to other men's plans. His experiences in South Africa and India had, strangely enough, failed to bring home to him that no amount of driving power can compensate for lack of organization; consequently he had little understanding of the value of a trained General Staff. The service which General Ballard puts in the forefront—and it was hidden from the public—was Kitchener's preservation, at all costs, of the alliance with France. It explains much that is otherwise hard to understand. As the author says, " he rushed to Paris to save the entente, he allowed Joffre to override his military judgment of the Salonika expedition in order to maintain goodwill with the French, he lost his life in a mission to Russia."

There is much of interest in the book on the probable reasons why Kitchener did not press for compulsory service. Finally, the author shows that the facts of the tragic loss of the " Hampshire " controvert all mythical stories of betrayal.

Service Trials and Tragedies. By Lieutenant-Colonel F. E. Whitton, C.M.G. (Hutchinson). 18s.

In his " Service Trials and Tragedies," Colonel Whitton has produced a readable and very instructive work, dealing as it does with many incidents and episodes which the most casual student of history cannot but have noted in the course of his reading, although he has probably not troubled to investigate them further. Now he will find them related in a manner neither too undressed to be uninteresting, nor too lengthy to be boring.

The author leads off with the episode of the desertion of Admiral Benbow by several of his Captains in the action with Ducasse, probably the most shameful happening in our Naval History. Other chapters deal with Byng's failure to make proper use of his fleet in order to relieve the garrison of Fort St. Philip, Minorca, which resulted in his execution on the quarter-deck of H.M.S. " Monarque."

Then we have the story of the thoughtlessness of Oliver Goldsmith's grand-nephew, Lieutenant Hugh Colvill Goldsmith, R.N., in dislodging the famous Logan Rock from its pivot, and of the difficulties he had to surmount in order to replace it. The tragic foundering of H.M.S. " Captain " with nearly all hands is well told, and it demonstrates how uninstructed popular opinion in this, as in one or two other " tragedies " in the book, was to a great extent responsible for the disaster.

Coming to the sister Service we have an account of the miscarriage of our cavalry in the victory of Minden, and the trial of Lord George Sackville for his share in it. It would appear, however, that the whole affair might be set down to the want of appreciation of the proper role of cavalry by the commanders on both sides. How, otherwise, could our infantry have "charged" and routed a strong body of French cavalry?

Other chapters deal with the well-known story of Benedict Arnold and Major André, the murderous duel between Major Campbell and Captain Boyd, for which the former was tried and hanged, the scandal of the sale of commissions by Mrs. Clarke, mistress of the Duke of York, "the best Commander-in-Chief the Army has ever had";[1] the disaster of Isandhlwana, and the death of the Prince Imperial. Three chapters are devoted to Lord Cardigan, his character and the charge of the Light Brigade, while others deal with the attempt of Frederick the Great when a young man to escape from the cruel tyranny of his father, an evil-minded bully troubled by religious mania. The story of the Dreyfus case is well and clearly told. Last, but not least, comes the account of the trial and execution of Edith Cavell.

The Expansion of Italy. By Luigi Villari. (London: Faber & Faber, Ltd.) 15s. od.

The most remarkable feature the present internal relations of Western Europe is the undoubted rivalry that has sprung up between France and Italy for the attainment of what is little less than a leading position in and along the shores of the Mediterranean Sea.

In the present volume we find the Italian side of the case put before us in clear language, with skill and with a moderation and studied reference to documents which is attractive and far more than plausible. The purpose of the book is, in fact, to prove that Italy's present internal reconstruction and external expansion "are a menace to no one." Mr. Villari argues that France has secured a long lead in the matter of overseas expansion, while enjoying a stronger strategic position than Italy. Consequently the position of the latter is regarded by Italians as being none too favourable; so they imagine that every attempt they may make to find elbow-room overseas for an expanding population arouses some kind of suspicion abroad. In short, as Mr. Villari remarks, Italians resent that "their legitimate aspirations to expand should be regarded as wicked Imperialism by those who, while professing pacifist sentiments, have practised Imperialism most successfully and extended their political and economic influence over half the world."

Now all this may be perfectly true, but it is certainly unfortunate for Italy that her expansion should, since 1912, seem invariably to be connected with conquest by force of arms or the victorious fruits of some peace treaty. So we find that Tripoli was acquired as the result of the Italo-Turkish War of 1912, the Dodecanese was finally retained by Italy after the Balkan Wars, while the Austrian Tyrol and Venetia fell into Italian hands after the Great War. Since that date Italy has virtually established a protectorate over Albania. It is, therefore, not surprising that she should be suspected of having behaved in a "Chauvinistic" manner. Then, there is the position in the (late Austrian) Tyrol, where the "absorption" of Italy's new subjects has formed a source of much controversy of recent years. All this is not surprising. Finally, the whole problem receives an altogether more threatening aspect owing to Signor Mussolini's seemingly truculent speeches. How far these outbursts may be intended purely for show,

[1] Fortescue.

or only for home consumption by the Fascist youth of Italy Mr. Villari does not say. His tone is far too moderate. Still one cannot help thinking that the strategic possibilities in Italy's new situation are by no means being overlooked in Rome. Time alone can show how far Mr. Villari's skilful arguments and presentation of facts will hold good in the event of the Franco-Italian tension ever becoming more acute. The book obviously treats of the future as much as it does of the present; it can be recommended to all students of the European situation to-day.

Towards Disaster; The Greek Army in Asia Minor in 1921.
By H.R.H. Prince Andrew of Greece. (John Murray). 15s. net.

Lieutenant-General Prince Andrew of Greece's book throws much light on the extraordinary internal troubles of the Hellenic Army in 1921. Before reading the text, those who have forgotten the details of the Greek adventure in Asia Minor are recommended to glance over the masterly account of its political genesis and the outline of the campaign in Mr. Winston Churchill's "Aftermath," and most carefully to read the preface by the translator, H.R.H. Princess Andrew (Princess Alice of Battenberg); for the Prince assumes on the part of his readers a good deal of knowledge of the general circumstances. His main purpose is to record the operations of his command and to show the absurdity of the charge made against him that the failure of the advance on Angora was due to his interference with the Commander-in-Chief's plans.

The officers of the Hellenic Army have for many years taken a great share in politics, and when King Constantine was expelled in 1917 and M. Venizelos, who was supported by a political association of officers called Amyna came into power, some two thousand royalist officers were turned out of the Army and some of them imprisoned. Prince Andrew himself took refuge in Switzerland. When in November, 1920, the elections went against M. Venizelos, and King Constantine returned, the royalist officers were reinstated, and where necessary promoted so as to restore to them the seniority which they had previously held. "The result was fatal, for besides the creation of innumerable superfluous posts in the upper ranks the Amynites and others were dissatisfied, for they lost the advantages acquired during the three years interregnum." The new Commander-in-Chief, General Papulas, had distinguished himself as a regimental commander in the Balkan war, but was not a scientific soldier; he was chosen "chiefly because he had spent the three years' interval from 1917 to 1920 in prison for his loyalty to King Constantine." To support him the King and the headquarters staff moved from Athens to Smyrna.

Prince Andrew received command of the 12th Division, its G.O.C. being "curtly ordered to hand over . . . and depart." It was not a good division, being "untrained and without war experience," a third of its infantry was "drawn from punishment training companies," and it was very short of guns and engineer equipment; but the Prince did good work with it in the first and very successful battle against the Turks (Eski Shehr, 9th-20th July, 1920), and he was promoted to the command of the IInd Corps. The subsequent advance towards Angora ended in a drawn battle. During its course on 9th September, the Prince, whose corps was on the right, was ordered to attack in a certain direction to turn the enemy's flank, but he pointed out that the Turkish front extended much further East than was supposed, and that the attack would be frontal, over difficult ground, and in any case slow. He suggested that it would be more effective to shift his corps to reinforce the left and reported he had issued preliminary orders and made dispositions for the move. General Papulas at

first objected strongly and the Prince asked to be relieved; but at 4 p.m. on the 10th, Papulas ordered the movement which the Prince had proposed. The attack was a failure, and on the 16th a withdrawal was begun to a winter position. The Prince claims that this was determined on before he made his suggestion. Political intrigues recommenced during the winter period of inactivity, and as the Prince was not allowed to dismiss the ringleaders, he resigned his command and was transferred to the Vth Corps (Epirus and the Ionian Islands). Thus he was not present with the Army in its final disaster a year later; as a result of which King Constantine had again to leave Greece, and Prince Andrew only escaped death by sentence of court martial through the timely help of a British warship.

NAVAL.

Captain James Cook, R.N. By Sir Joseph Carruthers. (John Murray). 7s. 6d.

There is a class of person whom nothing delights more than to invent or exploit scandal about great men, and from these people Captain Cook has suffered his share. The vilification of his memory began with the publication of an account of his last voyage by the irresponsible Ledyard, an American Corporal of Marines, whose misrepresentations have been widely followed, often by writers who ought to have known better. The object of Sir Joseph Carruthers is to clear Cook's memory from certain definite accusations: —(i) That Cook's discovery of the East Coast of Australia and his seizure of the continent for England were haphazard and not part of a definite, comprehensive plan; (ii) That he permitted himself to be worshipped as a god at Hawaii; (iii) That he brought his death on himself by the sacrilegeous seizure of a fence surrounding a temple, and by the general arrogance of his bearing towards the natives; (iv) That he permitted venereal disease to be communicated ashore by his men. The only charge Sir Joseph has any difficulty in sweeping away is the last where the position is prejudiced by a modest admission on the part of the accused. Sir Joseph shows, however, that even if Cook is guilty in this matter, it was not the result of carelessness. He did everything in his power to prevent such communication; the generous disposition of the Hawiiaan women probably defeated him; but, in spite of his admission, this is not certain. For the rest, Sir Joseph's conclusions are incontrovertible.

He prints the Admiralty's secret instructions to Cook which prove that his actions in Australia were part of a well thought out plan, and he shows that the mumbo-jumbo ceremonies to which he was subjected on landing at Hawaii were utterly incomprehensible to him, and that he had no notion that he was being taken for the truant god, Lono. What would Cook's accusers have had him do, even if he had known? Lastly, his murder was clearly the result of a misunderstanding. The alleged sacrilege had nothing to do with it since the removal of the fence had been condoned by the priests. The thieving propensities of the natives were really at the bottom of the trouble.

Sir Joseph Carruthers has brought sound judgment and breadth of mind to his work; in addition he defends the natives against many charges. His book will stand as an abiding reproach to Cook's slanderers.

Seth Harding, Mariner. By James L. Howard. (Yale University Press). 13s. 6d.

This book suffers from being "neither fish, flesh, nor good red herring." Its author has never made up his mind in what manner to make use of his material. It is partly written in ordinary historical style, partly consists of the reprinting

of manuscripts, and partly written in rather stilted, and presumably imaginary, dialogue. "A naval picture of the Revolution" is the book's sub-title, and the American Revolution is that referred to. Seth Harding left his new home in Nova Scotia when war broke out, and took command of several privateers under the State of Connecticut. He proved himself, in the capture of some English transports, to be a bold and resourceful fellow, and he became Captain of the frigate "Confederacy" in the American Navy, when he did good work for his country until forced to strike his flag to two English frigates. After the war he was destitute, his property in Nova Scotia having been seized, and the American Government was mean enough to keep him waiting until 1807 for a pension, though he had sacrificed everything to serve them. In the meantime, becoming too infirm for work in the merchant service, he was forced to keep a boarding-house.

The chief value of the book lies in its sidelights on the methods of the American Confederation and on the difficulties of manning their ships that American captains faced. Captain Harding himself is not brought to life with any great skill, and it is questionable whether the book would not have made easier reading, if his adventures had been fitted into some more general framework.

MILITARY

The Congreves; Father and Son. General Sir Walter Norris Congreve, V.C.; Bt.-Major William La Touche Congreve, V.C. By Lieutenant-Colonel L. H. Thornton, C.M.G., D.S.O., and Pamela Fraser. (John Murray). 15s.

To any soldier who may have had the privilege of being admitted into the family circle of General Congreve, more particularly in those days when he was still a regimental officer and doing regimental work, this book must appeal strongly. General Congreve with his sincere, modest and earnest personality was the true type of English country gentleman; one who did his duty on every day of his life with a distinction and strength of mind that is all too rare. He was not an enthusiast for games, still less for any form of social amusement, in the ordinary sense of the word. Yet physical fitness was to him a necessity of life. To this he added exceptional fearlessness, both physical and moral. It may be true that he made little visible effort at perfecting his intellectual equipment for high command, but his infinite common sense, sound judgment and thoroughness proved him to be a fine commander in war. With iron self-possession he combined great sympathy for the man in the ranks.

The son was clearly destined to follow in his father's footsteps, for he was instinct with the same ideals, the same gifts and the same tastes.

The present volume gives Walter Congreve's life in some 200 pages, only half of which concern the Great War. The narrative is largely made up of extracts from Congreve's diaries and letters, a wonderful human record of simple, direct impressions and opinions which reveal a great heart and simple mind. It is most unfortunate that Congreve's diary after 1915 is lost, since this might have revealed much that the reader would gladly know of his inner thoughts during that period. Not that he ever permitted himself to write much in the way of criticism; yet he more than once deplores the ceaseless little attacks of 1915 that cost more lives than they attained success.

"Billy" Congreve was a more boyish, more garrulous correspondent than his father. Equally modest, equally sincere, his letters give a striking picture of the daily routine of the earlier part of the war, with all its friendships,

associations, illusions and ideals. It provides fascinating reading. To a certain extent both father and son supplement each other's records of the war. Perhaps many of "Billy's" opinions and forecasts were inspired by his father? Both of them frequently met and exchanged views until "Billy's" inevitable, if lamentable, end.

It is a book which every soldier should read, since Walter Congreve provides one of the finest examples of the highest type of regimental officer. This he never ceased to be until the day of his death. As for "Billy," it is enough to state that he rivalled his father in every way as far as his years would allow.

The Peninsular Journal of Major-General Sir Benjamin D'Urban. Edited by I. J. Rousseau. (London: Longman's). 21s. od.

Sir Benjamin D'Urban's connection with South Africa is probably better calculated to make his name familiar to the present generation than is his long-distinguished record in the Peninsular War, where he served almost continuously from the arrival of Baird's Division at Corunna in October, 1808, to Toulouse, mainly under Marshal Beresford on the staff of the Portuguese Army, but latterly in command of a Portuguese cavalry brigade. Readers of military history, however, do not need to be reminded of the mine of information which Sir Charles Oman, in writing his "History of the Peninsular War," has found in D'Urban's Journals, to which he has had access since the appearance of his second volume. They will welcome the appearance of these Journals in book form, edited by Mr. I. J. Rousseau of the Department of History in the University of South Africa, who has done his work very carefully, though he might perhaps have prevailed upon the publisher to be a little more liberal as regards maps. The historical value of D'Urban's Journals perhaps is greater than their literary merit, for though there are places where D'Urban writes forcibly and fluently as in his summary (pp. 228-230), of Masséna's invasion of Portugal or in his description (p.290), of the storming of the outer line at Burgos by the 24th Regiment, the Journal largely consists of jottings, and is at times rather abrupt and disconnected. But it is full of good things, is plain-spoken and candid, and many of his criticisms are much to the point. D'Urban had a very high opinion of Wellington, "his conception of things is almost always just to a degree of intuition" he writes, (p. 223) but it is interesting to note that he thinks Wellington should not have resumed the siege of Badajoz after Albuera, but should have pressed against Soult (p. 221), even to the extent of following him into Andalusia. It is an interesting suggestion, but one wonders whether D'Urban is right in his view that Spencer "would have taken care of Marmont." That French Marshal was to show his energy and his readiness to subordinate his own interests to the general cause by his prompt march to the relief of Badajoz and Spencer's record hardly suggests that he could have held so accomplished an opponent.

Perhaps the most interesting part of the Journals is that which Sir Charles Oman has not used, describing D'Urban's adventures in 1808 and the early part of 1809. Being transferred from Baird's force to that in Portugal he prepared to go by land, and ride ahead of Baird by Astorga and Benavente to join Moore at Salamanca, doing useful reconnaissance work *en route*. He was then sent to reconnoitre the Portuguese frontier and he thus missed the retreat to Corunna. However, he had many adventures of his own, for he attached himself first to the troops under Sir Robert Wilson, and then to Cuesta's army, of whose rout at Medellin he was an eyewitness, before finally reaching Lisbon and being appointed to assist Beresford in his efforts to reorganize the Portuguese Army. Of that

work he might have well given fuller detail, for whatever Beresford's merits—or shortcomings—in the field, it was a contribution of enormous value to the ultimate success of the Allies.

REGIMENTAL HISTORIES

Famous Batteries of the Royal Artillery. By "Ubique" (W. H. Barrell, Ltd.: Portsmouth). 5s.

The Royal Artillery, not possessing any colours, stands at a disadvantage when compared with other Army units, in the matter of commemorating any battle honours. It has become the custom, therefore, to add the name of some celebrated warlike achievement, or of some particular regimental title, to the official designation of any particular battery. So we find "A" Battery, R.H.A., known as "The Chestnut Troop," or the 4th Heavy Battery bearing the additional title of "The Gibraltar Battery."

This little book sets to explain in popular fashion the manner and occasion of the acquisition of these titles, while also briefly relating the history of the forty or so batteries, R.A., which have won such distinction.

As a popular history of this class it would carry more weight if it gave more outward proof of greater accuracy. The reader will frequently find cause to quarrel with the author under this head. As it stands the book is marred by these flaws. Yet there is room for a good history of this nature. A revised and enlarged edition would be welcome.

The K.O.S.B. in the Great War. By Captain Stair Gillon (late King's Own Scottish Borderers). (Thomas Nelson & Sons, Ltd.: London, Edinburgh, etc.).

This handsome and well-written volume presents the story of the various battalions of the King's Own Scottish Borderers during the Great War. It is divided into six "Books," each of which traces the history of one particular battalion throughout the war, but Books III and V each deal with two battalions. This treatment seems to answer perfectly for this Regiment as it had never more than seven battalions at the front and these well distributed. The book is lavishly provided with maps but has not the usual appendixes. The index is good.

A Short History of the Royal Tank Corps. Anonymous. (Aldershot: Gale & Polden, Ltd.). 1s. 6d.

This excellent little book is not only a regimental history but also a brief survey of the origin and development of the tank as an instrument of war since 1914. It traces the achievements, both of the machine and of the Corps, throughout the Great War; it then shows the post-war re-organization of the whole Corps, and relates the development of the Armoured Car Companies, R.T.C. The whole work of the Corps in India, Egypt and Iraq is explained, although the story of armoured cars in Iraq is brought to a close with 1922. A few, clear, appendixes deal with the war-time expansion and present establishment of the Corps.

The Citizen Soldiers of Buckinghamshire, 1795-1926. By Major-General J. C. Swann, O.B.E., D.L. (Hazell, Watson & Viney, Ltd.). 7s. 6d.

This is an unusual type of Regimental History and one which presents features of marked interest. Since the days of John Hampden, Buckinghamshire has produced soldiers of the non-professional type possessing distinct characteristics and military aptitude. This volume treats in historical fashion of the creation and work of the Bucks Territorial County Association and of the units which it has administered, the Bucks Hussars, 1st and 2nd Bucks Battalions and a Mounted Brigade Field Ambulance. It includes a brief summary of the part played by these units in the Great War. An admirable and interesting production.

AIR.

Air Power and the Cities. By J. M. Spaight, C.B.E., LL.D. (Longmans, Green & Co.). 15s.

The special points discussed in this interesting book are (1) the legality and the precedents for bombing open towns: a procedure which perforce causes casualties to non-combatants, including women and children; and (2) the means by which the special characteristics of air power can be so employed that decisive results can be obtained without the usual preliminaries of the destruction or capture of the enemy's naval and military forces.

No question of legality or precedent arises when attacks are delivered against defended localities, but public opinion is decidedly against the promiscuous bombing or bombardment of open towns. Yet history affords numerous instances in which, for quite definite reasons, absolutely undefended, or practically undefended, towns have been subjected to bombardment. Air operations, owing to high mobility and wide striking range, may tend in some respects to follow naval precedents, but for obvious reasons the examples of bombardments of open towns recorded in "Air Power and the Cities" refer principally to naval actions. Of the numerous examples given, three will be quoted.

Valparaiso was bombarded by a Spanish Squadron in 1866 because the Chilians, who systematically avoided a fleet action, refused to comply with the Spanish demands. Furthermore, the Chilians were in process of forming an alliance with Peru and this would have added considerably to their naval strength. Due notice of the bombardment was given. The town was evacuated. Damage to the extent of about 15 million dollars was effected.

In 1914, Scarborough was bombarded by a German Squadron. The German view was that Scarborough was not an open town as there were barracks and a wired line of trenches on the North shore, also a quick-firing battery and a wireless station. It should be remembered, too, that the Admiralty Chart showed an area of water as liable to be used for gun practice (from an obsolete practice battery near the Castle).

The undefended Bulgarian port of Dedeagach was bombarded by British, French and Russian warships in October, 1915. This port was an important strategic railway junction and had quantities of stores of military significance. Due warning was given. Serious damage was done to the railway, the principal warehouses and shipping; the coal and oil supplies were destroyed.

These examples together with others in the book—nearly all of which formed the subject of earnest protests—and the large number of instances that occurred

during the Great War show that the bombardment, or bombing, of "open" towns is no new idea. It is, however, generally agreed that bombing should only be resorted to for some definite military object. But as in modern warfare almost every factory in every town may be contributing, directly or indirectly, to the production of war material, it follows that all towns are liable to be bombed, while neither long range gun fire, nor aerial bombing, have reached such a state of precision that military objects alone will be hit.

Mr. J. M. Spaight's view is that the two main objectives, "moral overthrow and military overthrow can be attained if the paralysing of munitionment is recognised, as it should be, as being the grand mission of the air arm." In his chapter "Woe to Armourers," he considers—and few deny the proposition—that munition workers will, and should be attacked; workers actively employed in producing lethal weapons cannot be regarded as non-combatants.

The principle of paralysing munition production is theoretically sound, but having regard to the enormous areas involved, it may not be feasible against a great Power. Delays and inconveniences on a large scale can undoubtedly be caused, but it has yet to be shown that the bombing of munition works can be so intensive as to be decisive.

The destruction of the dump at Andruicq in July, 1916, when 8,000 tons of ammunition were blown up and the successful attack on a German munition train at Thionville in 1918 are quoted as examples of air power as a disarming force. But both these occurrences ought to be regarded as classic blunders of the first magnitude. To pile up vast quantities of ammunition as at Andruicq, without paying due attention to reasonable dispersion, can only be regarded as a direct invitation to hostile bombers; to allow a munition train to halt in an important railway junction showed a deplorable lack of common sense.

Air power has enormous possibilities. That it should be directed against vital points is apparent, but what constitutes a vital point is not always so apparent. In any raid on the British Isles it seems generally agreed that London will be the magnet. That being so, no conventions comprising immunity of attack on crowded industrial centres are likely to be recognized by foreign delegates. No city can be made immune to air attacks, but, given adequate air defences and sufficient bombing squadrons for offensive purposes, accurate bombing will be difficult, heavy toll should be taken of raiders, and swift counter-strokes will fall on cities and vital points in the enemy's country.

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